Specification guide

Edexcel GCSE in Information & Communication Technology – Full Course (1185) & Short Course (3185)

First examination 2003

February 2001

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Authorised by Paul Sokoloff

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Contents

Introduction

This guide aims to provide support and guidance for teachers planning to enter candidates for the Edexcel GCSE courses in Information & Communication Technology - 1185 ICT (Full Course) and 3185 (Short Course).

Compared to other areas of the curriculum, a high proportion of teachers of ICT are not 'specialists' and may sometimes feel that their knowledge of the subject and how to best teach it is not as good as they would like. Other readers may have a background of teaching courses in computer studies, computer literacy and IT at a variety of levels. Hence, it is appreciated that this guide needs to meet the requirements of a very broad readership.

Successful planning for the delivery of a course leading to the new examination requires a thorough understanding of the coursework requirements and the subject knowledge that will be expected of candidates in the final examination. This guide adds to the information provided in the examination specification and aims to enable teachers to plan for the new courses with confidence.

Coursework is both a key part of the assessment process and a means of teaching much of the subject content. Ideas are provided for individual pieces of coursework along with further guidelines for interpreting the coursework marking scheme.

The sections concerning the final examination provide information that will enable centres to prepare candidates for this aspect of the assessment process as thoroughly as possible, including ideas for making maximum use of the annual case study.

Whilst it is hoped that this guide will satisfactorily answer many of the questions that you may have had after reading the examination specification, it may be that you feel some aspects still need further clarification. In these circumstances, your attention is drawn to the final 'Support and Training' section where you will find details of sources of further information, guidance and support. Centres should not hesitate to seek additional assistance from these sources to achieve the successful delivery of courses leading to these new Edexcel qualifications.

Changes old to new

The specification for GCSE in Information & Communication Technology was developed directly from the previous Edexcel syllabus for GCSE Information Technology (1984/3984) after consultation with centres to discover which features they valued and where improvements might be made. Teachers familiar with the GCSE IT syllabus should experience little difficulty in adapting to the new specification for ICT and most of their teaching materials will still be relevant.

Features retained from GCSE IT syllabus:

- 60% of marks from coursework, 40% from examination.
- Four coursework problems of equal weighting.
- Compulsory coursework problems involving spreadsheets and databases.
- Flexible choice of other two coursework problems.
- Common marking scheme for all coursework problems.
- Section of examination questions based on a case study that changes from year to year.

Features new to GCSE ICT specification:

- Content (learning outcomes) more clearly defined and updated to address topics of communications and networking.
- Extensive coursework guidance.
- Examination length reduced to 2 hours.
- Section of multiple choice examination questions.
- Details of case study available at beginning of year 10.
- Proxy arrangements for awarding IT key skill units at key skills levels 1 and 2.

Planning for delivery

The specifications for both 1185 (Full Course) and 3185 (Short Course) ICT emphasise a practical approach that underpins the development of ICT skills and knowledge.

Fundamental to the Full Course specification is the requirement for the solution of four coursework problems and preparation for a pre-released case study. The Short Course specification requires solutions to just two coursework problems and preparation for a pre-released case study which will be the same as that for the full course in each examination period. The planning of a suitable scheme of work for the delivery of either or both of these courses needs to address these requirements.

Equally important in planning for delivery is the requirement to demonstrate knowledge and understanding of the 'learning outcomes' (LO's) listed in the specifications. Many of these are best introduced whilst candidates are engaged in coursework activities, highlighting the practical approach recommended throughout the course.

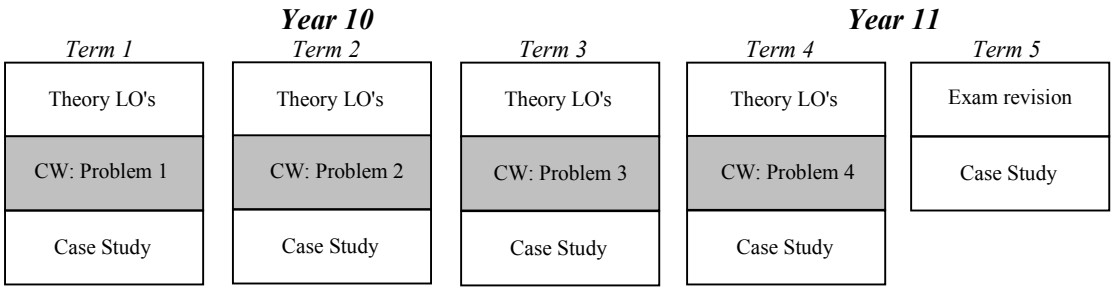
There is no single 'best' or recommended method of delivery. Teachers need to develop schemes of work suitable for their candidates that allow them to make the most of resources available to them and within constraints imposed by staffing, timetabling and facilities. What is presented here are details of methods that have been used successfully in some schools and other ideas that may prove useful.

In most schools GCSE courses are taught over a period of five terms of varying numbers of weeks. Planning a scheme for delivery around this structure will be the most appropriate method for many centres and the following models for delivery of the full course illustrate the range of possible approaches and the flexibility inherent in the specification.

Full Course: Model A

During each of the first four terms a coursework task is completed. Many teachers find that candidates produce some of their best coursework in Year 10 and starting coursework tasks as early as possible minimises the risk of 'running out of time' towards the end of the course. It also reduces the 'overload' complained of by many candidates as they approach coursework deadlines for many of their other GCSE subjects.

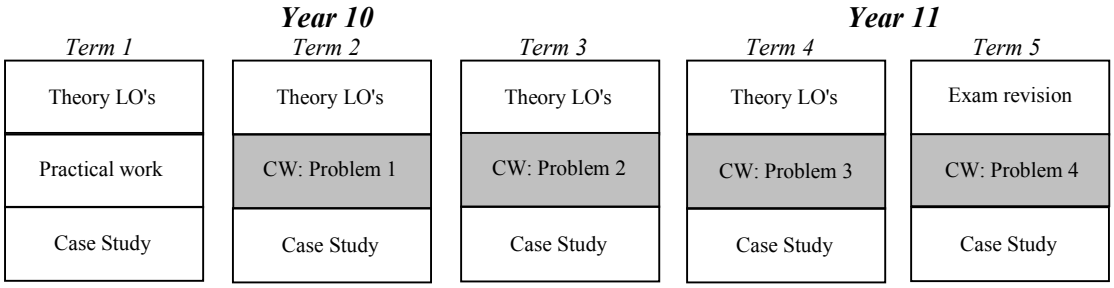
In parallel to the coursework tasks, the learning outcomes and aspects of the case study are introduced. This may be achieved through dedicated lessons or as particular topics naturally arise as part of coursework tasks. The final term is used to prepare for the terminal examination, including the case study (Paper 2 Section B). Evidence for key skills (communication and application of number) certification may be generated throughout the course.



N.B. The problems attempted must include a database and a spreadsheet problem

Full Course: Model B

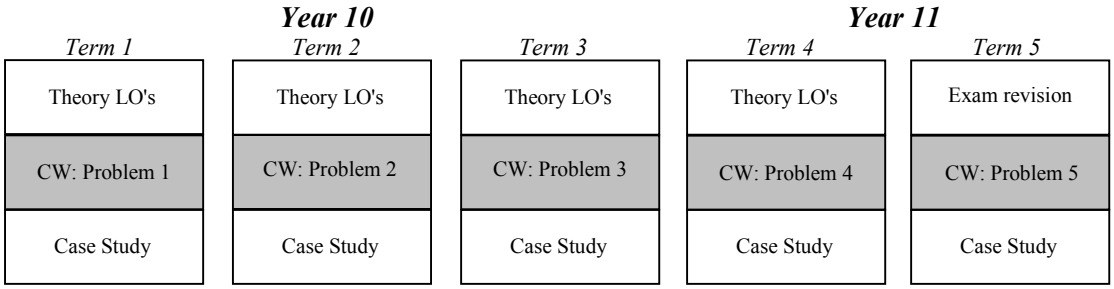
In some centres it may be felt that the first term is best spent building on practical skills acquired during key stage 3 courses, establishing the knowledge that underpins the GCSE and developing evidence for key skills certification. A coursework problem is then tackled during each of the remaining terms. It should be noted that this model leads to a concentration of work in the final examination term, but allows the fourth piece of coursework to be produced when candidates have more experience and maturity and should be most highly motivated.



N.B. The problems attempted must include a database and a spreadsheet problem

Full Course: Model C

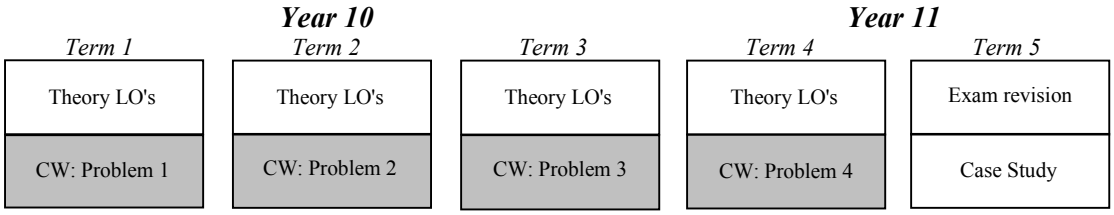
Although candidates are required to produce only four pieces of coursework, it is possible to find the time for five pieces to be produced. The solutions to the database and spreadsheet problems and the best two solutions to the other three problems attempted would then be submitted as the candidates coursework collection. Evidence for key skills certification may be generated throughout the course.



N.B. The problems attempted must include a database and a spreadsheet problem

Full Course: Model D

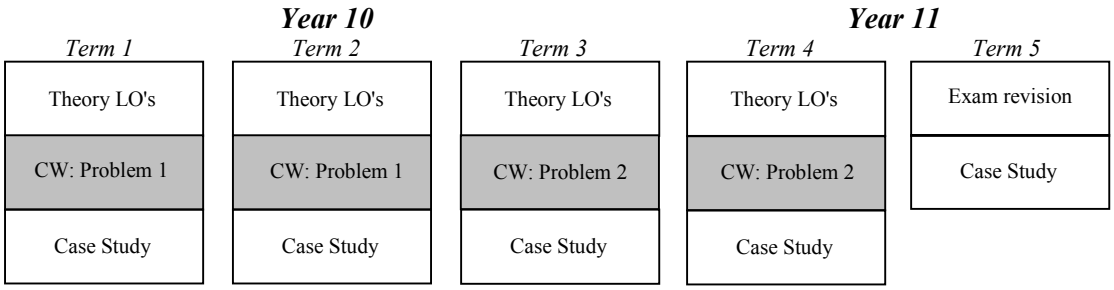
Some centres may prefer to leave work based around the case study until the final term. This approach allows the case study to serve as a means of revising some of the key concepts covered earlier in the course.



N.B. The problems attempted must include a database and a spreadsheet problem

Short Course: Model A

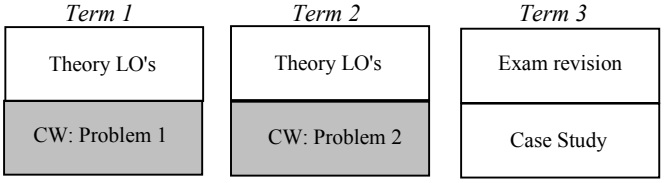
The short course may be run over a period of five terms, possibly in parallel with the full course. This model presumes a reduced timetable over the two years of key stage 4.



N.B. One coursework problem must be a database or spreadsheet problem

Short Course: Model B

Another way of delivering the short course is through a one year course with a full timetable allocation. The first two terms can be used to produce solutions to the two coursework problems and introduce the learning outcomes. The final term is then used to prepare candidates for the terminal examination, including the case study.



N.B. One coursework problem must be a database or spreadsheet problem

Alternative structures

A number of variations on each of these models is possible and they should not be seen as rigid recommendations, but possible starting points for planning delivery of the courses in a way that will meet the particular requirements of a centre and its candidates.

Both the Short and Full Courses could, in principle, be partly delivered as a 'cross curricular subject'. However, this method of delivery would require ICT to be well established in key curricular areas used as a context for the coursework problems. Pupils would also require regular contact with a teacher responsible for overseeing their coursework progress. Issues of standardisation also become paramount if many staff from disparate disciplines are involved in the marking of coursework problems. It should be remembered that the specifications emphasise both a practical approach and the acquisition of a body of theoretical knowledge that can only successfully occur in the context of taught lessons, ideally by specialist teachers.

In planning for delivery, schemes of work may be developed in conjunction with curriculum managers to ensure that departmentally designated key skills components are included. Throughout the course there are many opportunities to develop and demonstrate the Level 1 and 2 core key skills of communication and application of number (see page 48).

Organisation of Coursework

The Full Course specification requires candidates to complete the coursework problems: 'Creation and Manipulation of Spreadsheets' and 'Creation and Manipulation of Databases' and the Short Course specification requires candidates to produce a solution to at least one of these two problems. Centres are then free to choose the other coursework problem(s) from the following list:

- **Data Logging and Control**
- **Word Processing**
- **Desk Top Publishing**
- **Website Publishing**
- **Multi-media**
- **Programming**
- **Free Choice 1**
- **Free Choice 2.**

It should be noted that if Full Course candidates make one of the compulsory problem types one of their first two pieces of coursework, they will then have produced sufficient coursework to allow them to be entered for the Short Course examination, should absence or other factors prevent them from completing further pieces of coursework.

The most straightforward way of organising coursework is for all candidates to attempt the same four problem types. However, this approach may disadvantage some candidates by preventing them from using software they feel most confident with and exploring their individual interests. Experienced teachers may wish to take full advantage of the range of problem types and allow candidates to select their own problem types. However, the situation in which different candidates are working on different problem types places great demands on teachers and may make it more difficult to provide candidates with the support and guidance they need. Centres need to decide which of these alternative approaches is most suitable for their candidates.

The choice of problem types by centres will be dictated by a number of factors including availability of appropriate software and hardware, staff expertise and interests, and pupils' interests and aptitudes. Suggestions for possible projects are to be found elsewhere in this guide, on pages 17-20.

It may sometimes be appropriate for candidates to undertake multiple problem projects in which a more complex problem is tackled by splitting it into two (or more) smaller problems which can be treated as more than one piece of coursework e.g. mail merge projects involving database and word processing problems, or website projects involving database and web-publishing problems.

Candidates will need considerable support and guidance whilst tackling the coursework problems and this can be provided in a number of ways. A prompt sheet that indicates what they need to produce under each assessment heading (Identify, Analyse, Design, Implement, Evaluate) and poses a number of questions relevant to the chosen problem type is one means. A highly structured series of lessons in which the problem is dealt with a section at a time is another possibility. School intranets/websites are another effective and economical mechanism by which coursework support information can be provided to candidates. It is important that support materials produced by teachers are not over prescriptive and simplify the coursework tasks to such an extent that the most able candidates are deprived access to the highest marks.

The assessment of pieces of coursework under the five headings makes it possible for candidates to submit each section to staff for initial assessment and feedback. They may then take the opportunity to revise and improve their first draft for each section, enabling them to maximise their coursework score. In this situation it is important that staff avoid providing candidates with answers to key parts of the problem to be solved, but lead them to appropriate solutions through discussion and questioning. In assessing pieces of coursework, the marks awarded should reflect the amount of assistance that the candidate required in arriving at their solution to the problem. Explanation of the marks awarded should also be recorded on the Coursework Collection Marking Sheet (CCMS 1 for Full Course candidates and CCMS 2 for Short Course candidates).

Achieving the learning outcomes

The content of the specifications for both the Full and Short Courses are defined by the relevant list of 'learning outcomes' - a series of statements that clearly set out the knowledge and skills expected of candidates. Each learning outcome is accompanied by examples to assist its interpretation and an indication of the examination paper(s) in which it may be assessed.

For example:

Code	Learning outcome	To include -	Paper in which outcome may be examined
LO13	Present results for different target audiences **and justify the methods selected**.	Tables, diagrams, graphs.	1/2C

Content in bold is assessed only in the Higher Tier of the examination. In this example, all pupils will be expected to select suitable methods for presenting results, but justification of the method chosen would only be required on the Higher Tier Paper.

It is important to note that the learning outcomes are not of equal substance and the amount of time that should be dedicated to each will depend on its content. Also, the learning outcomes are part of an examination specification, not a scheme of work. Details provided in the 'To include' column should be seen as examples rather than a 'closed list'. Teaching in school would often be expected to go beyond what is specified in the 'To include' column.

This particular learning outcome is assessed through Paper 1 (the coursework problems) and section C (general structured questions) of Paper 2 (the terminal examination).

It is expected that that the learning outcomes will be primarily achieved through a structured course based around practical work – making use of opportunities to extend pupils' knowledge as they arise. Many should be achieved directly through pupils' coursework projects.

For example:

Code	Learning outcome	To include -	Paper in which outcome may be examined
LO9	Encode data and information for computer processing and relate this operation to a given application.	*Benefits of*: reduction in space required for storage and display, ease of data entry and validation.	1/2A/2B/2C

Candidates would be expected to consider encoding data during their database project and the benefits of encoding would be covered during class discussion at this time.

A check of the fourth column in the table of learning outcomes reveals that for the Full Course 16 out of 38, and for the Short Course 16 out of 26, learning outcomes 'may be examined' through coursework (Paper 1).

Other learning outcomes are difficult to cover through coursework and need to be addressed in alternative ways.

For example:

Code	Learning outcome	To include -	Paper in which outcome may be examined
LO29	Use the terms local area network (LAN) and wide area network (WAN).	*LAN*: computers on one site, connected using own cabling. *WAN*: computers on different sites, connected using telephone/satellite links.	2A/2B/2C

Some lesson time will be required to address these learning outcomes and a variety of delivery methods may be considered, including: whole class 'chalk and talk', textbooks, worksheets, case studies, group research and websites.

Knowledge and understanding of the learning outcomes can be usefully reinforced by regular classwork/homework exercises and testing in a variety of forms. The resources and textbooks suggested on page 52 in this guide will prove valuable in this task.

Assessment guidance – Examination

The specification defines the examination structure of the courses as follows:

GCSE ICT Full Course

Paper or Component	Mode of Assessment	Weighting	Length
Paper 1	4 Coursework Projects	60%	
Paper 2	Section A Multiple choice answer questions Section B Structured questions based on an annually, pre-released Case Study Section C Structured questions	40%	2 hours

GCSE ICT Short Course

Paper or Component	Mode of Assessment	Weighting	Length
Paper 1	2 Coursework Projects	60%	
Paper 2	Section A Multiple choice answer questions Section B Structured questions based on an annually pre-released Case Study	40%	1 hour

Further guidance on Paper 1, the coursework requirements, is provided in the next three sections. The booklet of Specimen Papers and Mark Schemes that accompanies the specification gives centres an overall picture of the terminal examination. This section aims to provide additional examples and information about the nature of questions that might be expected in each section of the terminal examination.

Section A: Multiple choice answer questions

Section A of Paper 2 will consist of 20 multiple-choice answer questions. There will be different questions set for each of the two tiers, Higher and Foundation.

The questions will consist of two types:

Single Answer

example:

> If you bought an encyclopaedia in computerised form, it would most likely be stored on:
>
> a a floppy disc
> b a hard disc
> c a CD ROM
> d magnetic tape.

Combination Answer

example:

> Which TWO tasks does an operating system carry out?
>
> 1 Allows a user to load files.
> 2 Displays an error message if a device is not available.
> 3 Works out staff payroll.
> 4 Calculates formulae with accuracy.
>
> a 1 and 3
> b 1 and 2
> c 2 and 3
> d 3 and 4

Multiple-choice answer questions will only be used to examine the learning outcomes in the specification where Paper '2A' is indicated in the final column.

Each question will be followed by a box for the candidate to write the letter corresponding to their choice of answer.

Candidates should be given the opportunity to practice example multiple-choice answer questions, such as those provided in the booklet of Specimen Papers and Mark Schemes, so that they are familiar with the two types of question described above.

Section B: Case study

At the start of the course (beginning of year 10) centres will be provided with details of the case study that will be used in the terminal examination. These details outline a context, which is used to set the questions in Section B of the examination.

The booklet of Specimen Papers and Mark Schemes contains one example of a case study (Betterview Opticians) and the related examination questions.

Centres may make use of the case study details in a variety of ways. It can be re-visited a number of times during the course and used as a context in which a number of key ICT concepts can be taught, providing a means of achieving the learning outcomes. (See 'Planning for Delivery' – Full Course Models A-C, on pages 3–4).

Alternatively, the case study details may be saved until the final term, after all coursework has been completed. (See 'Planning for Delivery' – Full Course Model D, on Page 5). A number of lessons can then be dedicated to discussion of the details provided. One advantage of this approach is that, with the preparatory work taking place in the final term, it should be fresh in candidates' minds during the terminal examination. The case study context can also be used as a means of revising key concepts covered earlier in the course that may also be examined in other parts of the terminal examination.

Teachers need to go through the case study details and identify the range of key ICT concepts that questions could cover. Reference to the list of learning outcomes in the specification would be advisable at this stage. Once this has been done plans can be made for inclusion of these links with the case study throughout the course or a series of preparation/revision lessons at the end of the course.

Using the example case study details for Betterview Opticians provided in the booklet of Specimen Papers and Mark Schemes, the following key concepts could have been identified by teachers. The relevant learning outcomes are indicated in parenthesis.

- Data Logging and Control. Design of Data Logging and Control system to maintain environmental conditions in Betterview's laboratory *(LO17,20,28)*.
- Networking and communications *(LO18,29,30,31,32,34)*.
- Selection of suitable software and hardware for administrative tasks *(LO5,6,19)*.
- Spreadsheets. Design of suitable spreadsheet for appointment sheet *(LO5,12,20)*.
- Desktop publishing. Sources of text and images for DTP *(LO7,8)*.
- Internet. Advantages and disadvantages of using the Internet for advertising *(LO34,35,36,37,38)*.
- Master and transaction files, updating process *(LO7)*.
- Databases. Structure of customer file. Importance of key field. Possible searches/sorts. Data verification and validation. Design of staff file and pay file *(LO9,10,11,12,14,15)*.
- Personal data – Role of Data Protection Act *(LO24)*.
- Staff pay spreadsheet – formulae for column G. Data validation *(LO5,6,11,20)*.

Close attention to the table of learning outcomes will reveal that not all of those listed above will be examined in Section B of the case study, but it would seem sensible to make use of the opportunity to also address learning outcomes that could be examined elsewhere in the terminal examination.

Section C: General structured questions (Full Course only)

The learning outcomes (LO's) that will be assessed in this section of the paper are detailed in the specifications. Those parts that are emboldened will be addressed only in the Higher Tier of entry.

The required content of answers will be flagged by key words used by the examiner.

Candidates should be made aware of the following definitions of the key words that may be used in structured questions.

State Very brief, usually one or two word answers.

List A number of features or points, each often no more than a single word, with no further detail required.

Define Requires a statement giving the meaning of a particular term.

Describe Requires the description of the feature - no more.

Explain A reason or interpretation must be given, not a description.

If the question requests three examples, and the student answers with five examples, all will be marked and the principle of positive marking adopted- marks will be awarded, up to the maximum available for the question, for any correct examples.

Guidance on tiering

Candidates must be entered for one of two tiers.

The **Higher Tier** is targeted at grades A* to D, with an allowed Grade E as a safety net. Candidates failing to achieve a Grade E will be reported as Unclassified (Grade U).

The **Foundation Tier** is targeted at grades C to G. Candidates who are expected to obtain a Grade D should be entered for the Foundation Tier, rather than risking the possibility of a U grade.

The learning outcomes are assessed through coursework and the terminal examination. The list of learning outcomes clearly indicates the subject content that will only be examined in the Higher Tier Paper of the terminal examination and this should be borne in mind when deciding on the tier of entry for individual candidates.

However, since 60% of marks in these GCSE's are awarded for coursework, teachers should be aware that end of Year 10 exams, or any other test results, may be poor indicators of a candidate's potential in this subject.

The 'Planning for delivery' section of this guide suggests that one or two pieces of coursework be completed in Year 10. Internally moderated marks obtained for these pieces of coursework are a good predictor of performance, and should be considered in conjunction with any internal examination results when deciding upon candidates' tier of entry.

Guidance on Quality of Written Communication (QoWC)

The Quality of Written Communication will be examined in both the coursework (Paper 1) and the terminal examination (Paper 2).

Coursework

Up to eight marks overall (not per item of coursework) maybe awarded by the teacher. The mark is recorded on the Coursework Collection Cover Sheet (CCCS 1 for Full Course candidates and CCCS 2 for Short Course candidates).

Assessment Criteria:

Level 1	Information given has limited relevance and is presented with a little clarity. Candidates spell, punctuate and use the rules of grammar with some accuracy.	1-2 marks
Level 2	Some relevant information is presented, with varying degrees of clarity. Candidates spell, punctuate and use the rules of grammar with reasonable accuracy; they use words and phrases – including specialist terms – with some accuracy.	3-5 marks
Level 3	Relevant information is presented, with clarity of expression. Candidates spell, punctuate with considerable accuracy, and use the rules of grammatical constructions, competently employing specialist and ICT terms.	6-8 marks

Centres with a candidature that does not cover the full ability range may not necessarily use all of the levels when awarding a QoWC mark to their candidates. In these circumstances centres should use the above criteria and not feel that they must have a full range of QoWC marks.

Terminal Examination

Marks will be awarded in Section B for both the Full and Short Courses and in Section C for the Full Course. The same assessment criteria as used above will apply, and the marks available will be outlined in the annually-released Mark Schemes for the summer Examinations. A sample version can be found on page 74 of the (1185) Full Course GCSE ICT Specimen Papers and Mark Schemes document that accompanies the specification.

Assessment guidance - Coursework

The most critical part of any coursework project is the choice of the problem. Pupils will need guidance to choose a problem that is realistic and attainable but also challenging enough to give them the chance to maximise their mark.

An easy problem for a bright pupil will limit the mark to a maximum of 30/40 even if the solution is excellent. Conversely, a below-average pupil attempting a difficult problem may find it hard to score reasonable marks in most of the sections due to the complexity of the solution required.

All problems can be divided into two levels, Standard and Extension and **once the level has been decided the teacher must not give marks that are out of the range of that level, as outlined in the specification.**

Whilst two candidates may attempt similar problems, the way in which they solve them could be very different.

Example- A shop's accounts.

Student X produces: A spreadsheet with an income, expenditure and profit column. Formulas for total income, total expenditure, profit and total profit.

Student Y produces: A spreadsheet with several sheets, income log, expenditure log, monthly breakdowns and a yearly profit. Lookup tables are used to produce monthly and yearly sheets. The spreadsheet interface has been customised to allow the shop owner to use the spreadsheet easily.

It would be unfair to mark both of these attempted problem solutions to the same maximum mark. Student Y's Analysis, Design and Implement sections of the project report would be far more complex than those for Student X. Student X may do the simpler task very well and include everything needed, but overall will have had an easier project.

Therefore it is important that before the teacher attempts to mark an individual project they decide on whether it is a **Standard** or **Extension** problem. This may not be possible until the Implement section is completed as the criteria for the decision are based on ICT skills. A pupil may produce Analysis and Design that suggest they are going to use complex ICT skills in their solution, but if there is no evidence of this in the implementation then the project should be marked as a Standard level project.

Clear guidance is given in the specification regarding the criteria for Standard and Extension projects.

Teachers must also be aware that it is not possible just to 'tack on' more complex ICT skills to a project to try and make it into Extension level project as the specification clearly states that the processes must be relevant of the solution to the problem and will therefore also appear in the Analysis and Design sections as well as the Implement section.

Ideas for coursework projects

This section contains a collection of ideas for possible projects for each of the coursework problem types. The best projects are those that will hold candidates' interest and enthusiasm for an extended period of time. It is important that candidates select achievable projects and teachers may often need to override candidates' initial plans to ensure that they have every chance of success when they start the piece of coursework. The scenarios of less able candidates choosing over ambitious projects and able candidates selecting undemanding projects are all too common and steps must be taken to avoid them. In many cases a suggested project can be interpreted by candidates at Standard or Extension levels and this needs to be considered when deciding whether marks to be awarded should come from the Standard or Extension range.

Creation and manipulation of spreadsheets

- Break even analysis for a business.
- Model of a biological system to represent calorie intake and expenditure.
- Generation of employee pay slips.
- Model of energy flow through each stage of production from energy source to electrical energy output in a power station.
- Nutrient and/or cost calculations for particular dishes/meals.
- Manipulation of data obtained through an investigation in some other subject area (science, geography, history, maths, P.E.…).
- Model a part of an ecosystem, for example a 'Foxes and Rabbits' population analysis.
- Costings for the manufacture/production of a new product.
- Model of traffic queues at traffic lights at a single file road works or junction.
- Handling financial data for a small business/club.

Creation and manipulation of databases

There is a wide variety of possible situations where candidates could investigate the application of database software. These include:

- video library
- garage
- nursery
- newsagent
- milk round
- hair dresser
- farm
- dentist
- vet
- stables
- mail order business
- estate agent
- travel agent
- solicitor
- gym/sports club
- accountant
- adult education centre
- beauty salon
- kennels
- builder
- coach hire business
- pharmacist
- driving school
- dating agency
- optician
- restaurant
- public house
- record shop
- political party
- social club.

Word processing

Of all the possible problem types, candidates are likely to feel most confident using word processing software. However, there is a danger of problems of this type being over simplistic and involving little more than text editing. Many candidates will need to have their knowledge of the range of features provided by modern word processing software extended if they are to score highly.

Possible projects include:

÷ business letters

÷ coursework reports for other subjects that are primarily text based with few illustrations.

÷ collections of poems

÷ scripts

÷ programmes.

Desk top publishing

Inevitably, there is the possibility of confusion as to what constitutes a DTP problem rather than a word processing problem. The most convenient way of drawing a distinction between these application packages is to categorise any problem that involves predominantly text, without the need for frames, a word processing problem. Other problems involving inclusion of graphics and more complex layouts should be seen as DTP problems.

Possible projects include:

÷ advertising material (flyers, posters, magazine adverts)

÷ magazine and newspaper pages.

÷ coursework reports for other subjects that require inclusion of a number of graphic images.

÷ brochures

÷ catalogues.

Data logging and control

Projects of this problem type provide an opportunity for links with the use of ICT in other subject areas. These are well signposted in GCSE specifications in many curricular areas including Science and Humanities.

Possible projects include:

÷ traffic junctions

÷ lifts

÷ greenhouses

÷ controlled environments – e.g. incubator, fish tank, vivarium

÷ alarm systems

÷ children's toys

÷ car park barrier

÷ collection of data needed for a science or geography investigation.

It is worth noting that class sets of specialist hardware are not essential for this type of project, although candidates should demonstrate an understanding of the hardware required to solve their problem. Many specialist software packages can be used very effectively to simulate candidate's data logging and control systems. It is important that candidates' projects contain evidence of the output of their system and full listings of any programs that have been developed.

Website publishing

Modern software designed for the purpose frees candidates from the constraints of coding, and allows them to concentrate on the design and construction of their web-site. Although it is possible to construct effective web-sites using some desktop publishing packages, it is important to ensure that pupils' problems and solutions are more than screen based desktop publishing. Page routing, and the maintenance and testing of links between pages are essential aspects of this problem type.

Possible projects include:

÷ promotional websites (businesses, charities, music, film, video, computer game..)

÷ interest websites (clubs, societies..)

÷ educational websites

÷ intranets for companies and educational establishments.

Multimedia

Many of the projects suggested for web site design problems would also be suitable for presentations produced with a specialist multimedia authoring package. 'Powerpoint' type presentations could also be included under this problem type, but it should be noted that simple presentations based around the use of clip art images will not score highly.

Programming

Most projects likely to be identified by candidates would be best approached using an existing applications package. However, centres with candidates who have an interest in programming may choose to use a high level language such as Visual Basic or Visual C++ to produce solutions to their chosen problem. It is important to stress that problems selected of this type must have realistic and achievable goals and candidates must avoid the situation of spending hours programming with little final reward if the other assessment headings are neglected.

Possible projects could include:

÷ a simple calculator for young children

÷ learning games for nursery school children e.g. images appear after clicking a sequence of buttons on the interface

÷ a 'pub quiz' game that provides a random set of questions and records the user's score

÷ a maths teaching aid for younger pupils

÷ producing animation sequences as teaching aids- for example, for Physics, a model of molecule behaviour during a change of state

÷ an application front end.

Free-choices

Most problems will clearly fall under one of the problem type headings already discussed. However, the specifications also provide a 'Free choice' problem type. This allows centres and their candidates to attempt problems that reflect their own interests and expertise or make full use of other software packages they may have available to them. Any 'Free choice' problem chosen must be **different** from any other project that is presented for assessment. This will typically mean using a different software package.

Possible projects could include:

- graphics software
- CAD/CAM
- video image transformations
- video editing
- musical composition
- musical notation.

Alternatively, a 'Free choice' problem makes it possible for a candidate to use the same software package to solve two different problems. This feature of the specification makes it possible for a candidate to produce two projects that make use of spreadsheet software or a programming language, as long as the two problems and their solutions are clearly different and make use of different features of the software.

Example of student's work and moderator's comments

The following is an example of a student's work for the Creation and Manipulation of Databases problem type. The student's written work is reproduced in italics, together with scanned samples of their preparatory work and printed screen-shots as appropriate. The Moderator's individual comments are clearly outlined throughout with grey shading, with a full analysis and explanation of marks at the end of each section.

Identify

When I went in for my last dentist's appointment I noticed that they still used an old card file system for keeping their records and it seemed that a computer version would be a much better idea for them to use. It took ages to find my details and they wrote out the next appointment on a piece of card that I have already lost and can't remember when the appointment is for. So I asked if they would like me to create a database solution for them as it would help me with my GCSE coursework and they agreed to help me, although pointed out that they were not too sure if they would actually use my database when it was finished.

There seems to be other problems as well with the card system because they only kept the appointment in a diary and it would take ages for them to write out letters to everyone who has appointments. So is some people do not turn up the dentists have nothing to do and I guess they would lose money as well, which can't be good for their business. With a computer system they could send out letters to those people who had appointments to remind them of when to turn up and that must be good for their business.

One of the receptionists agreed that she would have a look at what I created, but for the moment my family have said they would help me with telling me how good or bad my system is.

I know that I have to use a database program to make the system because I will need to search through the database to find those people who have appointments which are coming up shortly, other packages such as spreadsheets and word processors can only sort data and can't actually search for different people and so I am going to use Lotus Approach at my school to do my project on.

The things I will need to do are:

- *create a database to hold all the records of the people that go to the dentist*
- *make some letters to send to the people who have appointments coming up*
- *work out how my database can be improved*
- *create something that is easy to use for the people who work at the dentists.*

Overall Marking Comments: Identify section	
Problem	**Clear statement of problem.**
Real user	**Dentist, receptionist a name would have been an improvement.**
Possible solutions	**This is missing. Comments concerning alternative manual methods and comparison with ICT solutions are needed.**
Objectives	**1 Quantitative, but not realistic in terms of data entry.** **2 Quantitative, clearly defined objective.** **3 Not a good objective.** **4 Not quantitative, but OK.**
Mark: 3/5 **(Discussion of software is in wrong section, but will be included in the Analyse mark).**	

Analyse

I have already said that I need to use a database to make my project on but I now need to think about exactly what I need to make so that the project works. I will need:

- *fields to go into my database. These will include name and address, telephone number, last appointment, next appointment, any money owed, dental history, allergies, date of birth, sex, customer reference number*
- *a data capture form for when the computer is not available and for people to fill in when they first come to the dentist's*
- *some letters to send out when an appointment is due and one if they owe money to the dentists*
- *an evaluation form to find out how I can improve my first database*
- *maybe even a telephone sheet so that people can be reminded over the phone the day before.*

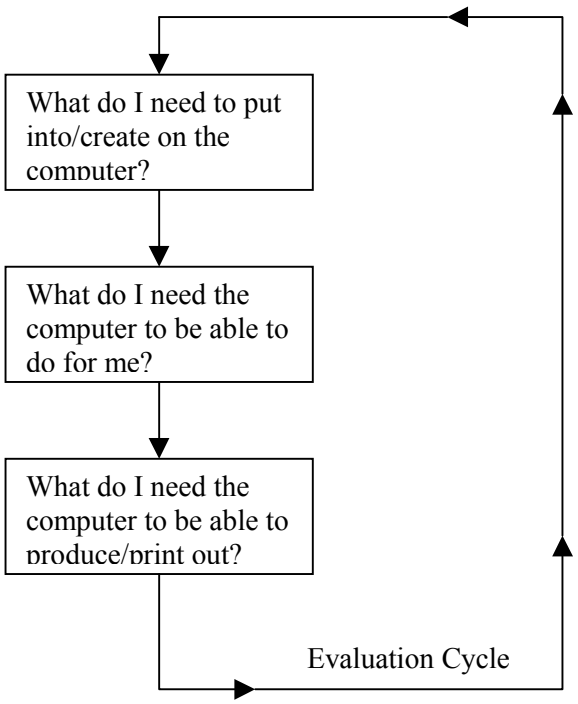
In Lotus Approach I will need to be able to do the following things to make my database work:

- *create a screen input form so data can be keyed in by people who work there*
- *do searches to find people who need to have letters sent to them*
- *print off these letters*
- *have things like macro buttons so that it is easy for the user to use*
- *I will also have to use a word processing package so that I can make the data capture forms and the evaluation forms*
- *change fields on the database if I need to if improvements have to be made*
- *print out a telephone report when a search is done the day before.*

I will need to be able to output the following things:

- *I have to print letters, evaluation forms, data capture forms and telephone sheets*
- *I do not need to print the database but I have to let people be able to see the database on the screen so that they can add new records and do searches.*

When I have created my database I will need to find out how it can be improved, the evaluation forms will help me to do this because the comments on them will show me what changes have to be made. This gives me a diagram that looks like the one on the next page:



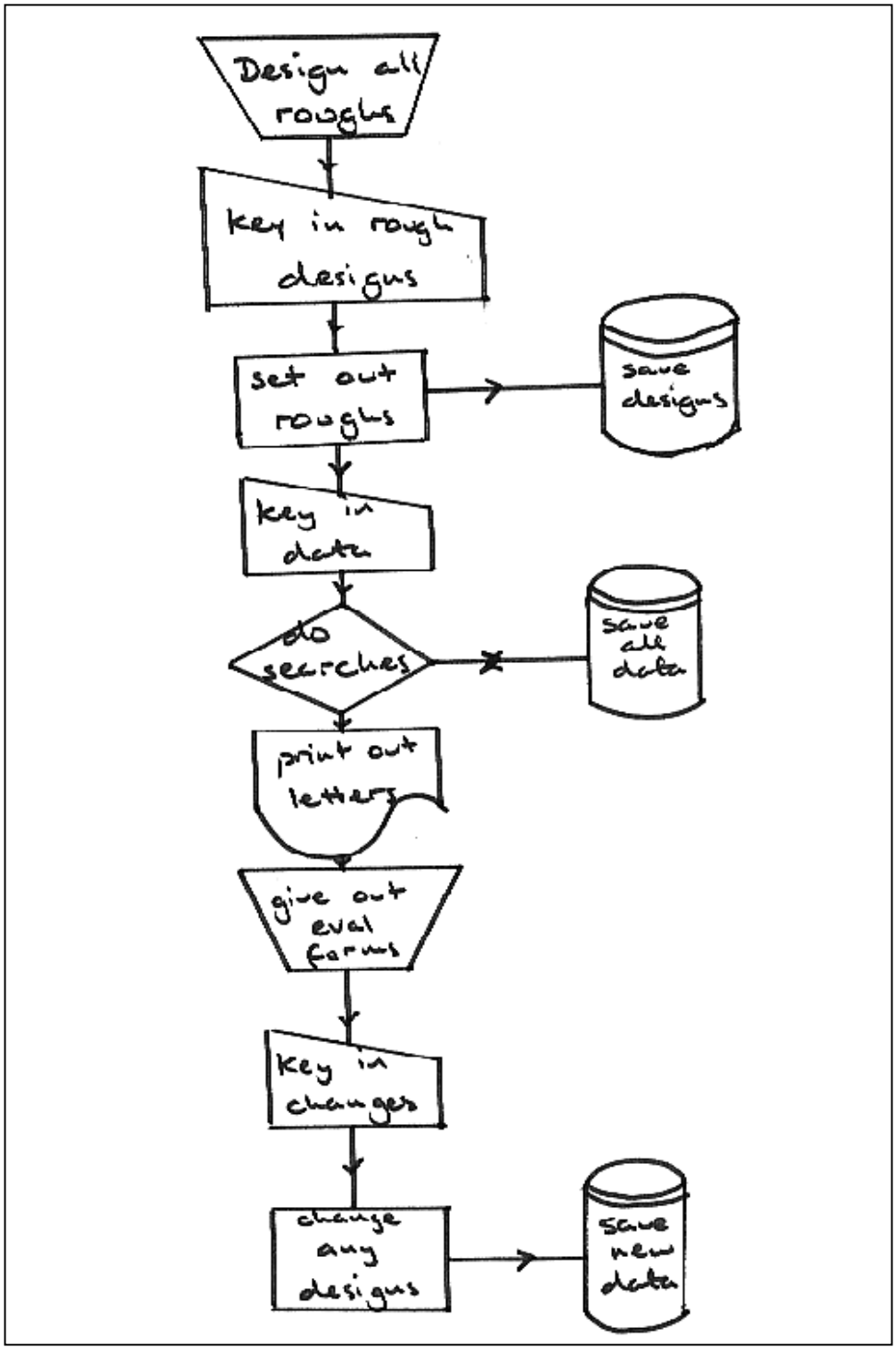
When I have created the whole database it will also need to be put on a floppy disk so that if anything goes wrong when it is used then there is a saved copy that can be used to start again.

It does not really matter about the hardware that is used because the database will not use up much memory or need a powerful computer processor, but of course they will need a printer to print off the letters!

Overall Marking Comments: Analyse **(Assuming this is an 'Extension' level project - see overall marking comments on page 44. n.b. For a 'Standard' project the maximum mark that could ever be awarded for this section would be 6)**	
Software	**Good choice and sensible reasons.**
Hardware	**A little vague.**
Input	**Just adequate, example of form required, no suggestion of number of patients.**
Process	**Poor, concentrates on tasks and not the method. Needed ideas on how to find the people who needed letters. What buttons would be needed to make it easy to use. Flowchart is not about data flow and is worthless in terms of understanding the problem.**
Output	**A little more detail is required about layout and content.**
Back up/ Security	**Back up does not relate to the problem but to the students work. No mention of security. Passwords needed due to Data Protection Act.**
Mark: 5/9	

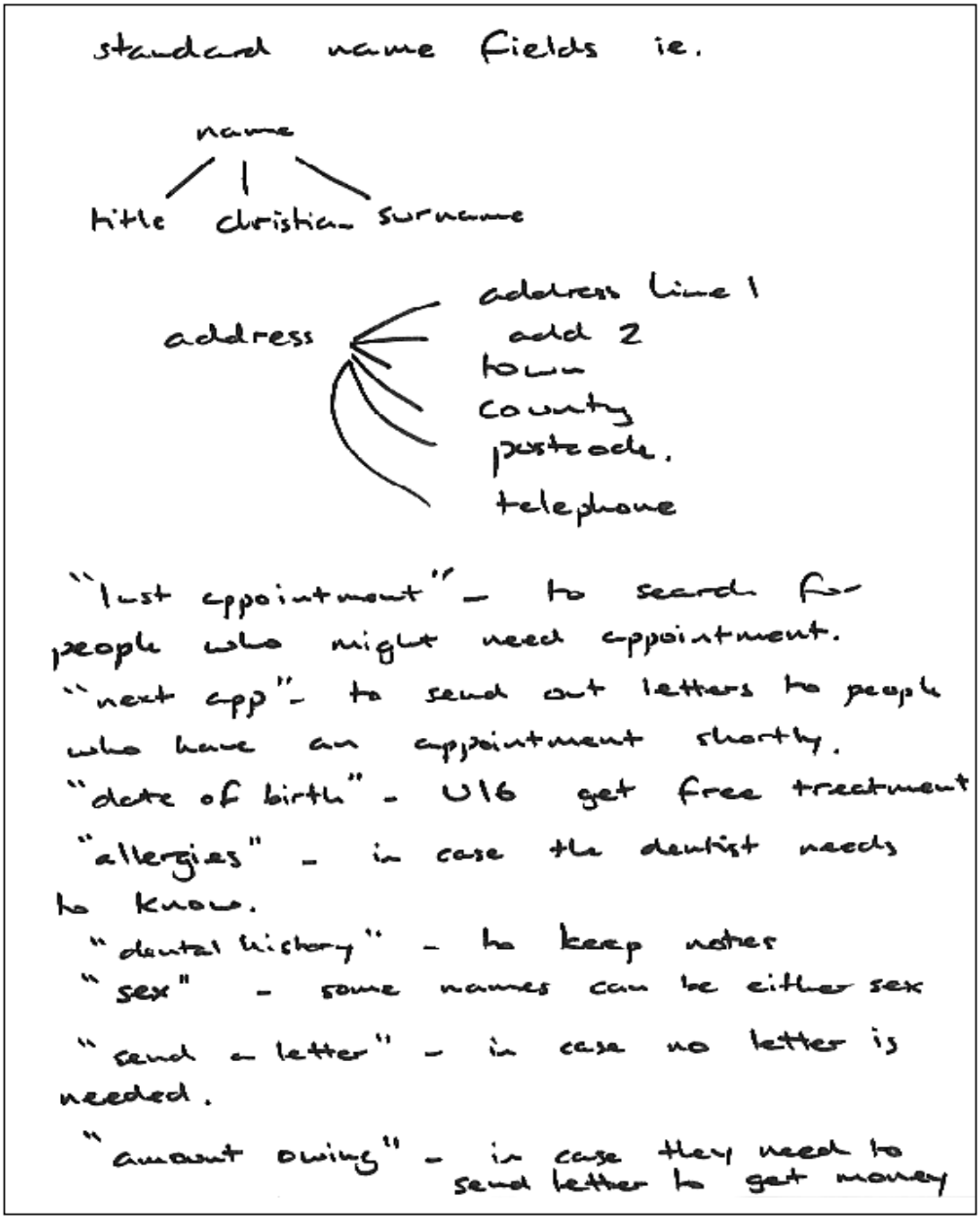
Design

The first thing that I will need to create is a systems flowchart. This will give me an overview of the steps that I will need to take to complete this project and to put everything into the right order.



Marker's Comments
Systems diagram is of little use as it is showing the candidate's method of solving the problem and not how the problem is going to be solved.

Now that I have worked out what I have to do to complete this project I can begin to design the database for the dentist. The first thing I will have to do is to set the database up, and as I have already worked out what fields will need to be included to make the database work then all I have to do is to set them up in the right way. To do this I went back to the dentist with all the fields and asked them for suggestions as to the size that they would need to be. I have attached the notes that I made on the sheets below and overleaf.

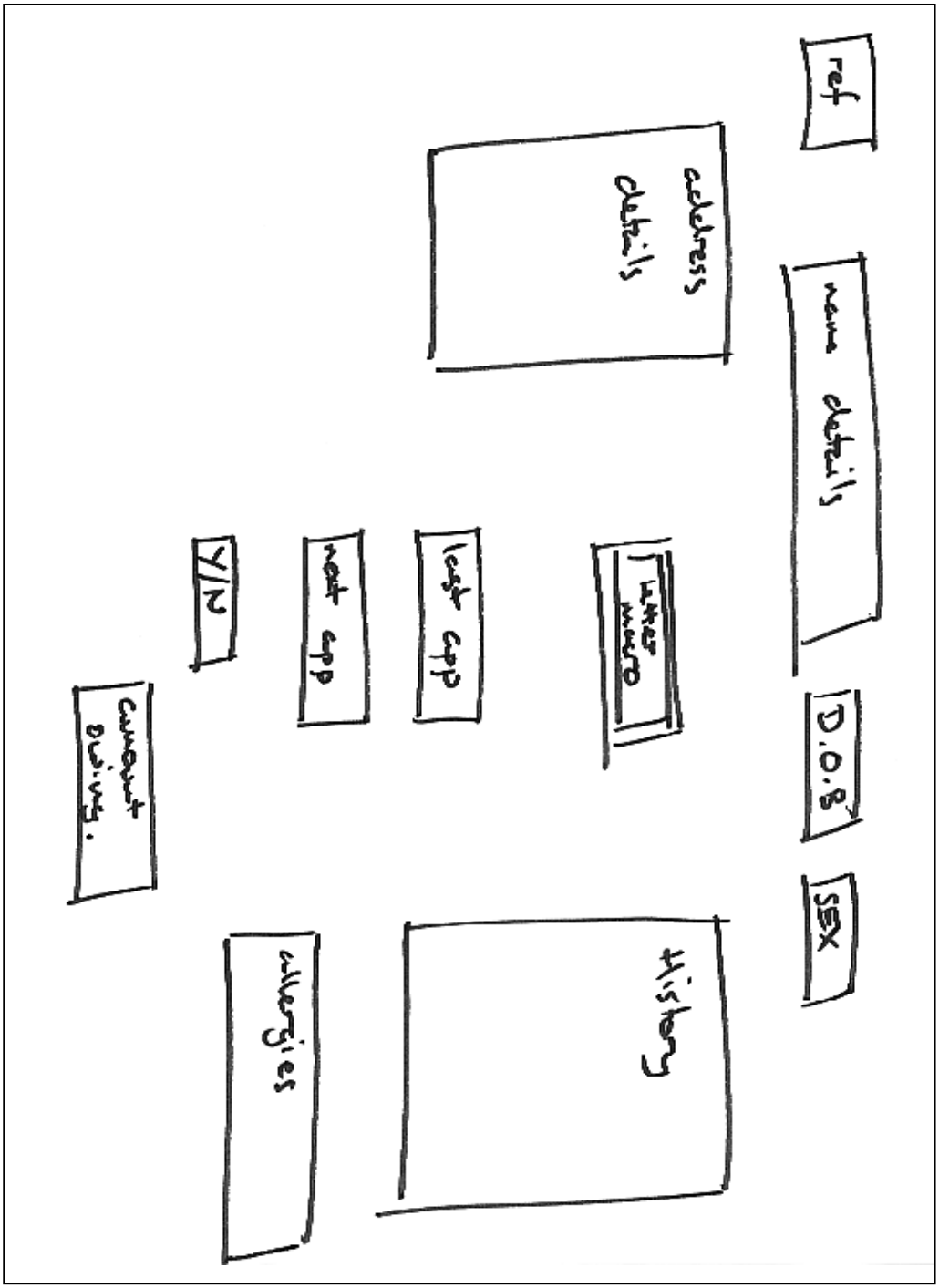


Marker's Comments
Good reasons for inclusion and use of fields.

1. *Title – text field, 4 characters long because the longest is "miss"*
2. *First name – text field, 12 characters long because the longest name I can think of is "Christopher"*
3. *Surname – text field, 20 characters long because some people have two names in their surname*
4. *Add1 – I will have 2 address line fields because some people have a house with a name, both will be 20 characters long so that any name can be put in*
5. *Add2 – as above*
6. *Town – text, 15 characters so that all towns can be put in*
7. *County – text, 15 characters long so that all counties can be put in some can be shortened like Hampshire to Hants but 15 should be enough*
8. *Postcode – text, 8 all postcodes are 8 characters including the space in the middle*
9. *Telephone – text, 13 characters because you can have mobile numbers that are longer*
10. *Last appointment – date field*
11. *Next appointment – date field*
12. *Date of Birth – date field I did not use "age" because it changes every year*
13. *Allergies – text, 50 characters because people might be allergic to lots of things*
14. *Dental History – text , 200 characters so there is lots of room to put in problems that people might have*
15. *Sex – text , 1 character because it is either M or F*
16. *patient reference field – numeric, 5 characters, unique, because some people may have the same name like John Smith (I shall use an auto serial option which means that every time I put in a new record then a new number is given to the record, that way 2 records can't have the same number)*
17. *Send a letter – text, 1 character "y" or "n" field, as some people want a reminder letter and some may not*
18. *Amount owing – numeric 3.2, I don't think anyone will owe a dentist over £1,000*

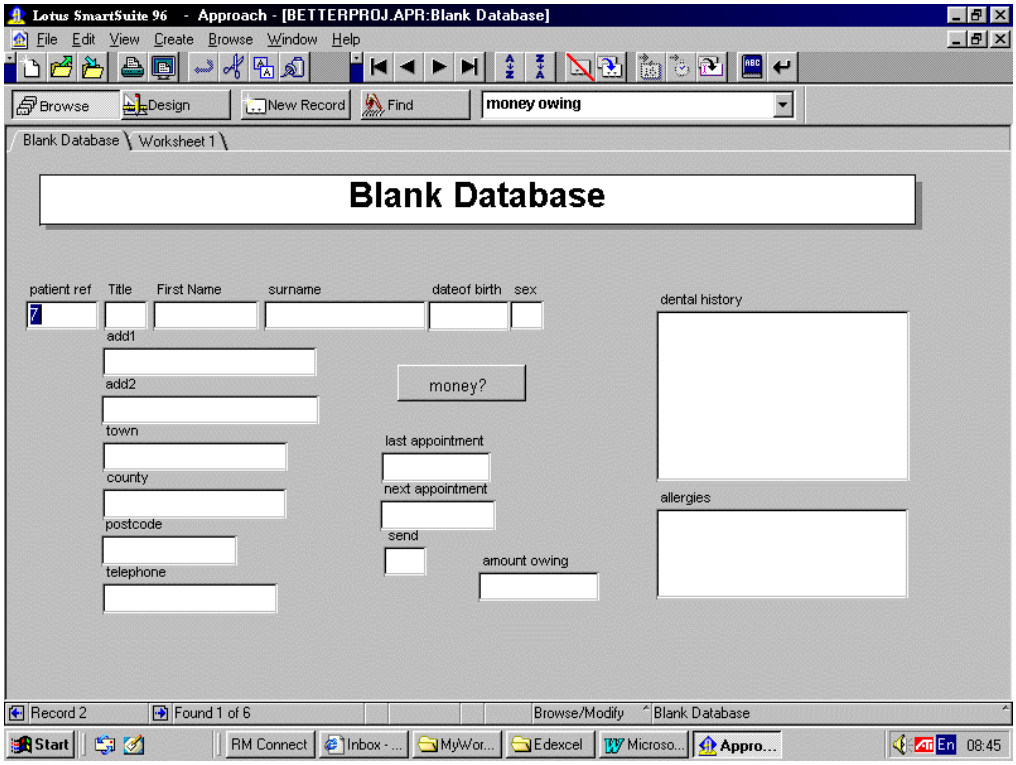
Marker's Comments
Shows file structure, but this may have been better presented in table format.

So now I have a database but it needs to be designed so that it is easy to look at and easy for the receptionists to key in the data. The best idea is to lay this out on a piece of paper first and to try and set it out so that all the field boxes are visible on the screen, because if some of them are not and the receptionists have to scroll down then they may not put in some important information. On the next page is a rough design of how I wanted the screen to look. I will need to record some macros so that the user does not have to do the searches themselves but can press a button so that the computer does it automatically for them. I will talk about the macros later in 'Design'.



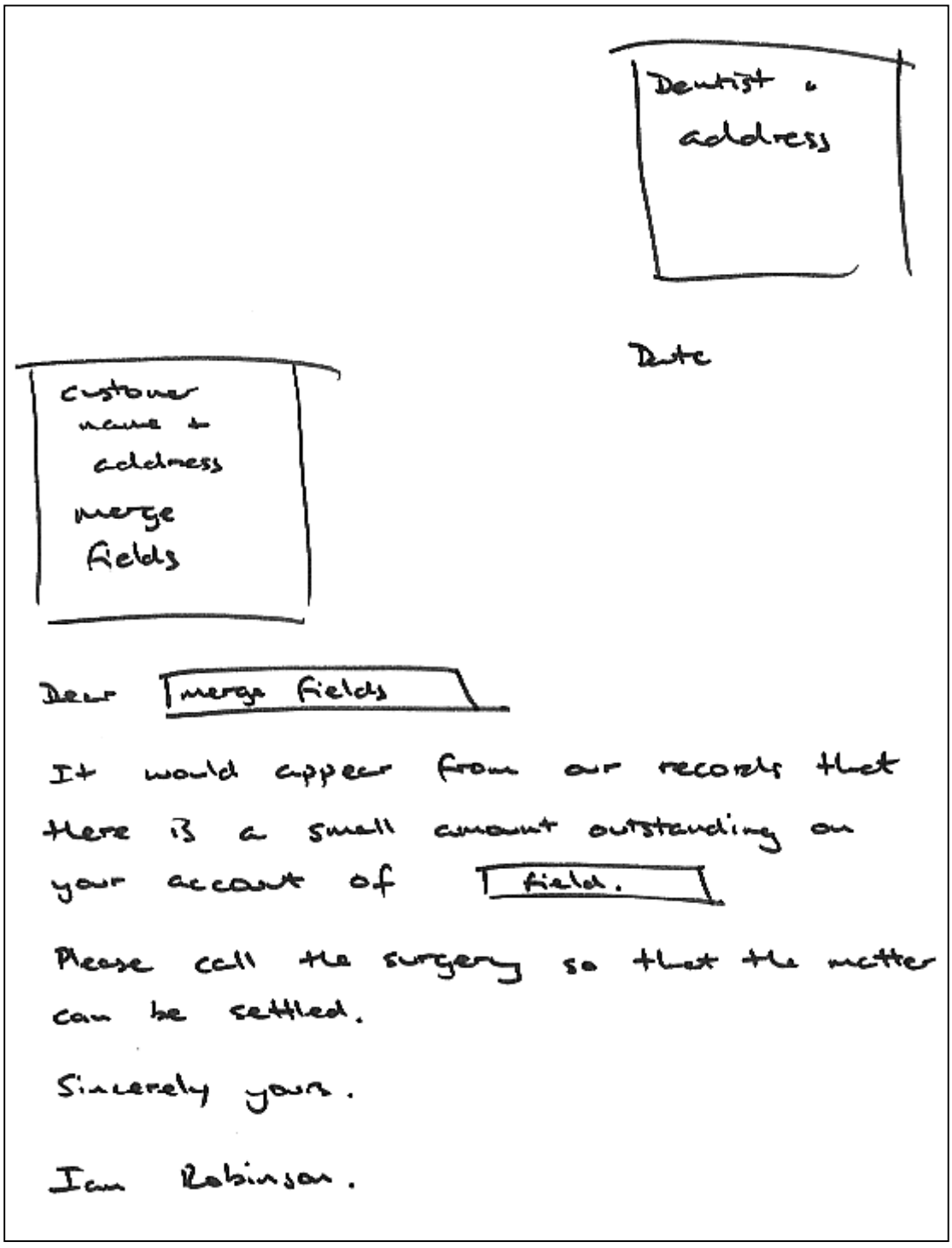
Marker's Comments
Needs a little more data such as font type/sizes and screen size (pixels).

Now that I have designed how I want the screen to look then all I have to do is set it out on the computer so it looks like my rough design, I have put in a screenshot to show that this has been done. I have checked the rough with the receptionists first of all and they were happy with the design.

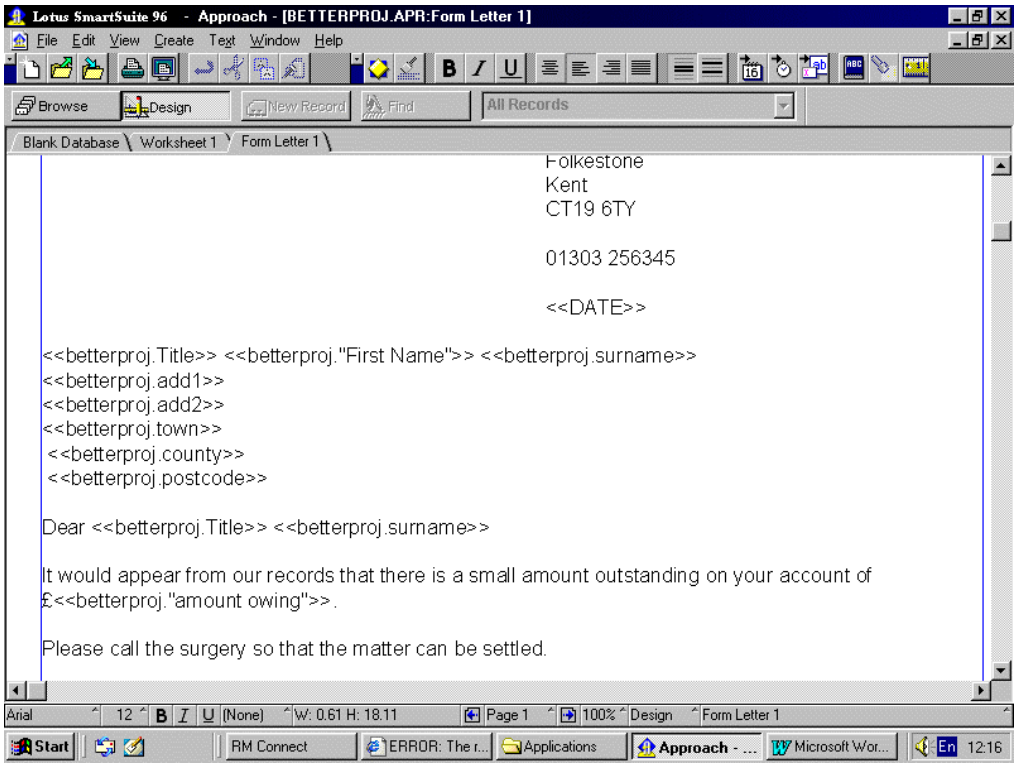


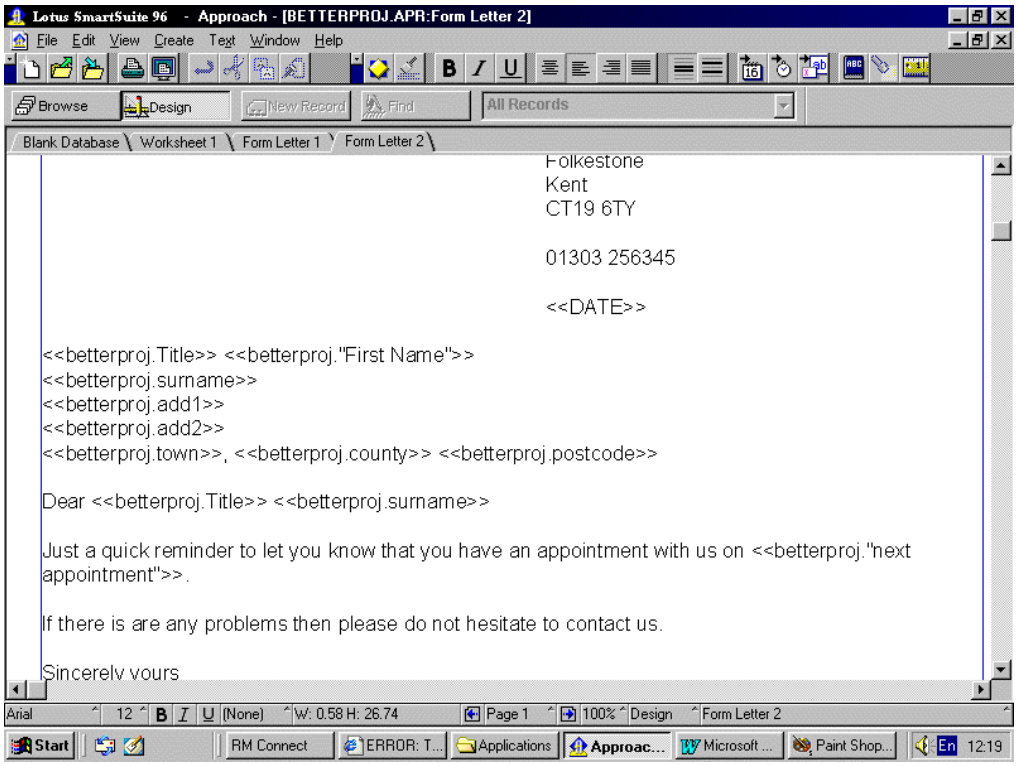
Marker's Comments
Although this is Implementation and not Design, there is quite a difference between the design on the last page and this screen shot. Reasons for the changes should be given.

Now I have a database I have to design some letters to be sent out to those people who will need them. The dentist said that it was ok for me to design the letters myself as I did explain that they could be changed later if they were not what he wanted. I wrote them out in rough first and then typed them up in the word processor within Lotus Approach and included all the mail merge fields needed. The next few sheets show that this has been done.



Marker's Comments
Needs a little more information such as font type/sizes and paper size and the fields that are going to be used from the database.





Marker's Comments
These screen shots are Implementation and will be marked in the Implement section.

Sometimes the receptionists said they might not be able to use the computer because it may break down so they asked what would happen then. We decided that they would simply need a sheet of paper to write the patient's details down on and they could put the information into the computer when they wanted to later on. This data capture form does not need all the fields on it as it would really be just for new people so I created a simple form on Word that they could fill in. A copy of the data capture form is shown below:

Title:
First Names:
Surname:
Sex:
Date of Birth:
Address:
Town:
County:
Postcode:
Telephone:

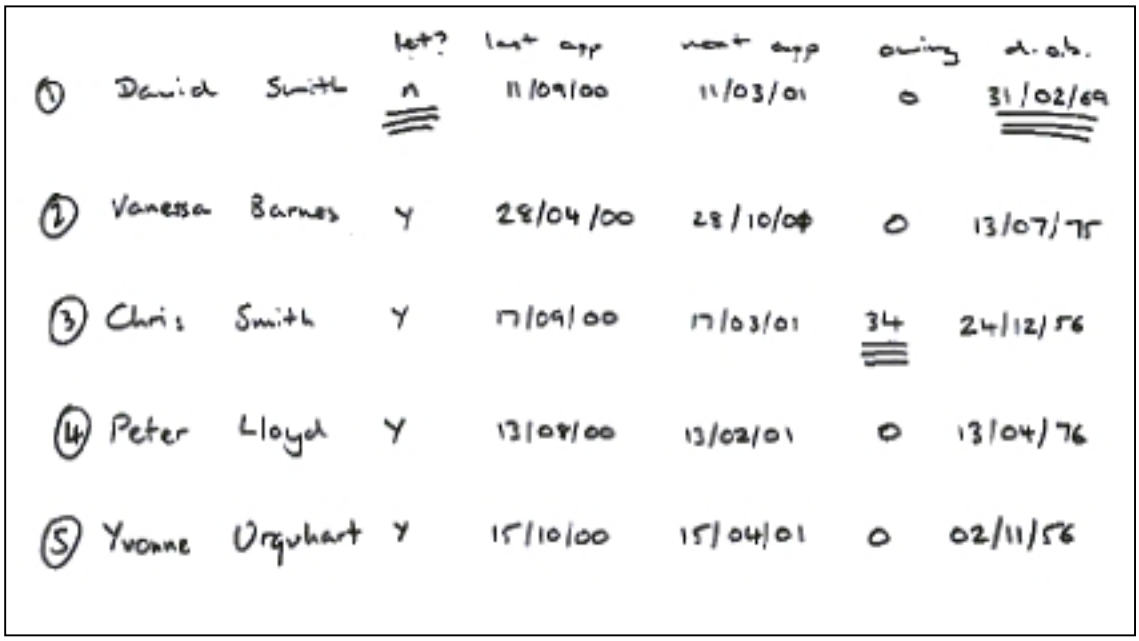
Any known allergies?

The next thing to do was to design the searches that needed to be done and create some macro buttons so that the receptionists would not have to type in the searches every time and they could just push a button to make the database work. I needed to find those people who owe money this was done by simply writing a macro to perform a search for those people who had "money owing" greater than "0", then I simply attached it to a button, as shown in the earlier screenshot. However, I could not create a button to do a date search as the date is constantly changing so a macro could not be recorded. I will have to show the receptionists how to do this manually. It was also noted that some people might not want to have a reminder letter sent to them. To enable this to happen I included a field that indicated whether a letter was to be sent or not, I could then run an "and" search so that the database picked out only the people with Y in this field and then sent letters to people who matched the data find as well.

Marker's Comments
Buttons should have been included on hand-drawn designs and the macro code needs to be given in detail.

I now need to consider how I will test my database to see if it actually works. Initially I will put in some dummy data and I will need to see if the results from the searches actually match what I manually worked out, and I also need to test the database to see if I can input data that is incorrect such as 31/02/01 which is an invalid date. I need to check that the letters I have designed are filled in correctly.

The next thing that I need to do is to put some data into the database to show that the searches work and wrong data can not be put in. To do this I will create 5 dummy records by hand and then put them in and do the searches. The dummy data is recorded on the sheet below. I have deliberately made one date of birth out of the range to check that the software will pick up this problem, the rest of the search tests are shown in the screen shots overleaf.



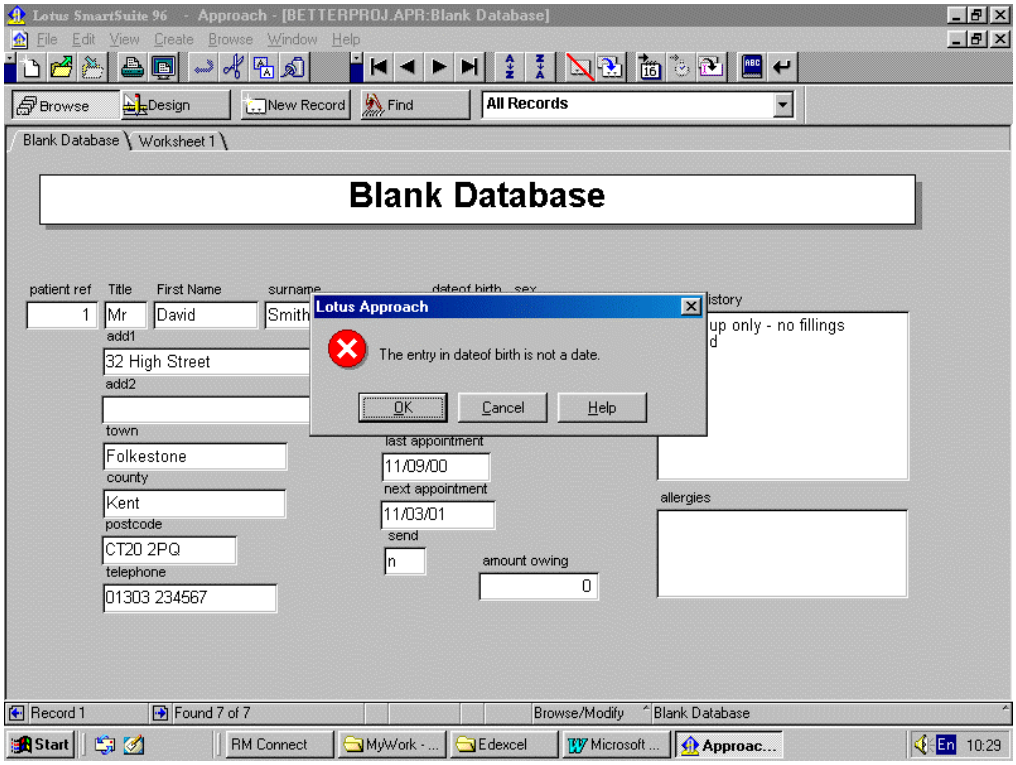
			let?	last app	next app	owing	d.o.b.
1	David	Smith	n	11/09/00	11/03/01	0	31/02/69
2	Vanessa	Barnes	Y	28/04/00	28/10/01	0	13/07/75
3	Chris	Smith	Y	17/09/00	17/03/01	34	24/12/56
4	Peter	Lloyd	Y	13/09/00	13/02/01	0	13/04/76
5	Yvonne	Urquhart	Y	15/10/00	15/04/01	0	02/11/56

Marker's Comments:
Test data is OK, but the reason for each item in terms of testing should have been explained. **Mention is made of manually worked out results and testing sorts and searches, but a test plan is needed to show the tests that are going to be implemented, with expected results.**

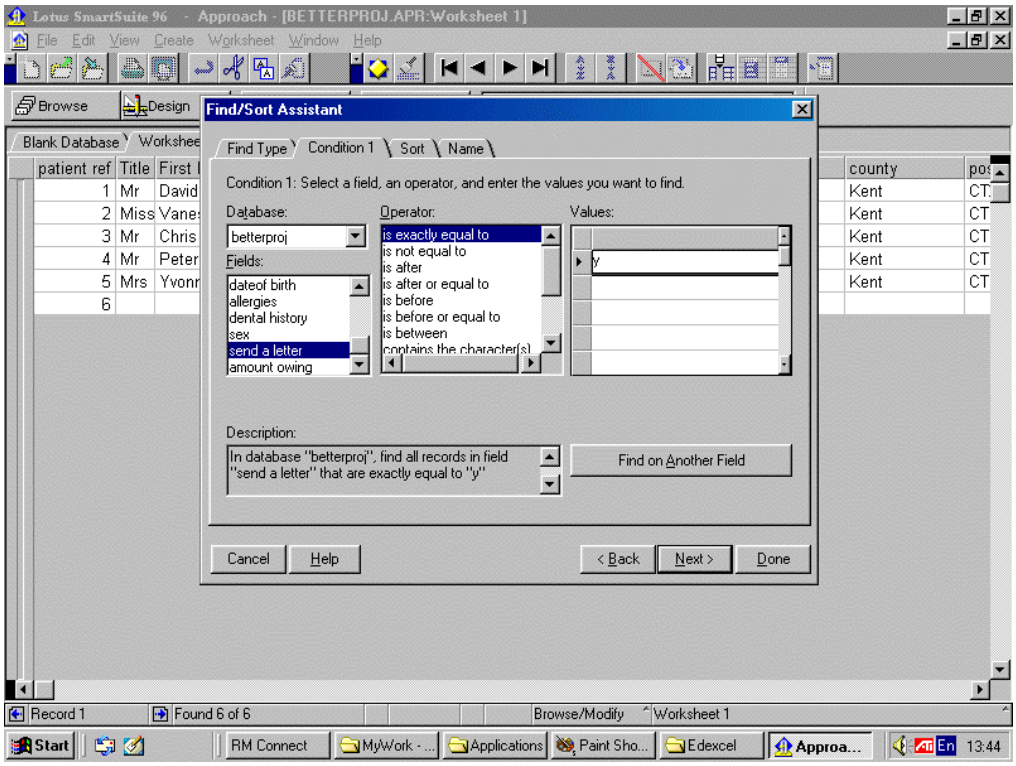
Overall Marking Comments: Design	
(Assuming this is an 'Extension' level project - see overall marking comments on page 44. For a 'Standard' project the maximum mark that could ever be awarded for this section would be 6)	
Initial Designs	**Just adequate, searches, sorts and macros were not mentioned.**
User Feedback	**Mentioned but no direct comments from user.**
Final Designs	**Lacked detail. Full file structure details should have been included.**
Test Plans	**Test data mentioned but no test plan.**
Mark: 4/9	

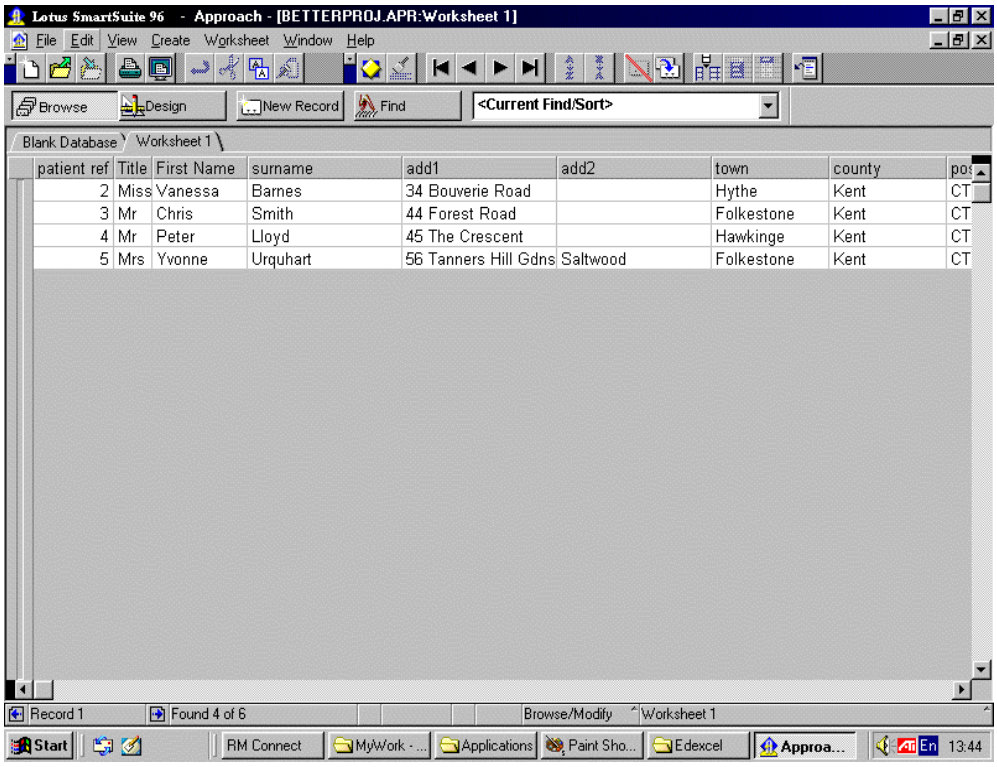
Implement

When I tried to input David Smith's date of birth as 31/02/69 I got the following screenshot so I can say that invalid dates can not be put in.

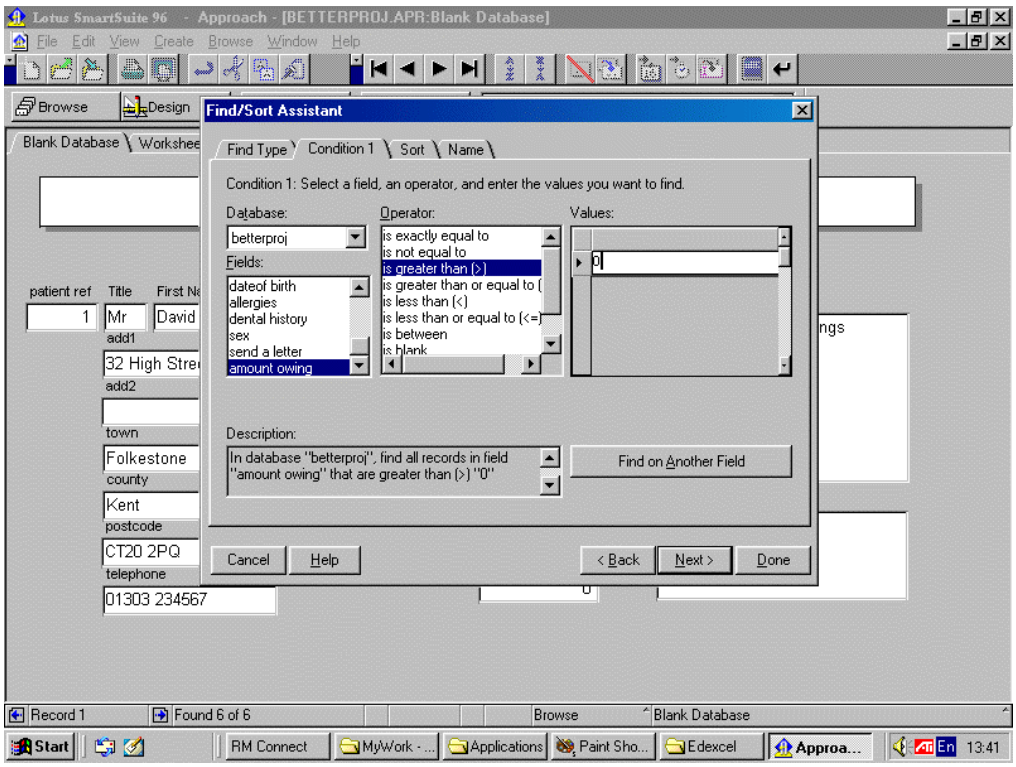


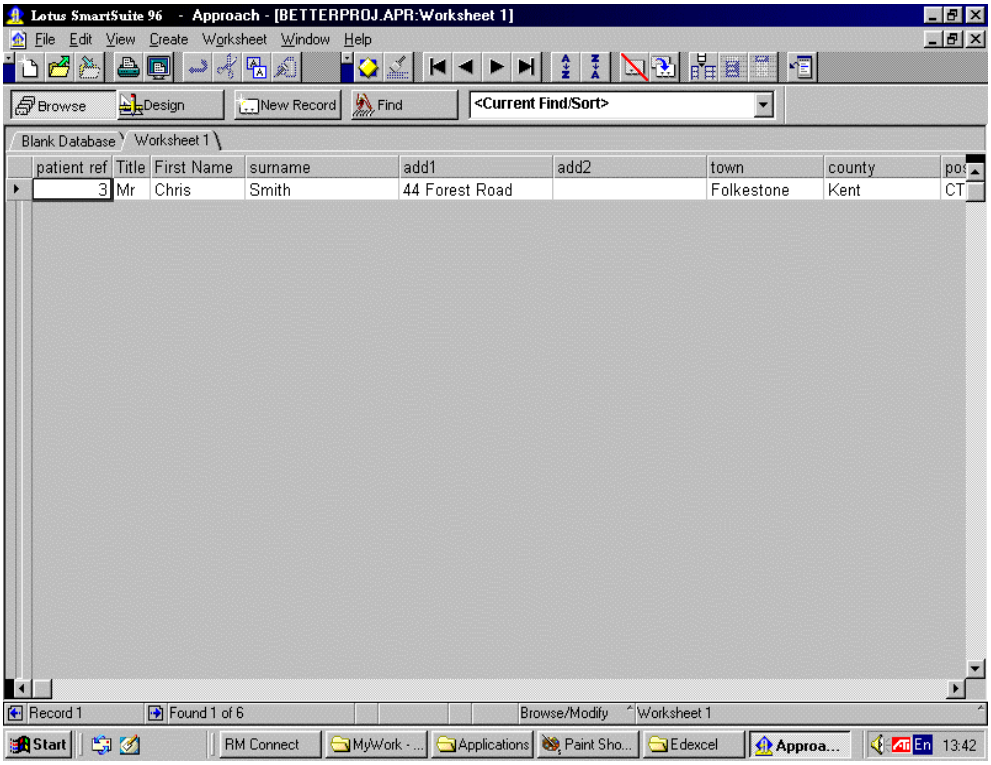
I need to test whether the dummy data produced the right results to show that the database is actually working. If I search for the letter to be sent field, then record 1 of David Smith should not be picked out and as you can see from below it was not.





Next I need to test that anybody who owes money to the dentist gets picked up by the "money owing" sort, again the screenshots below prove that this does happen and the database does actually work.



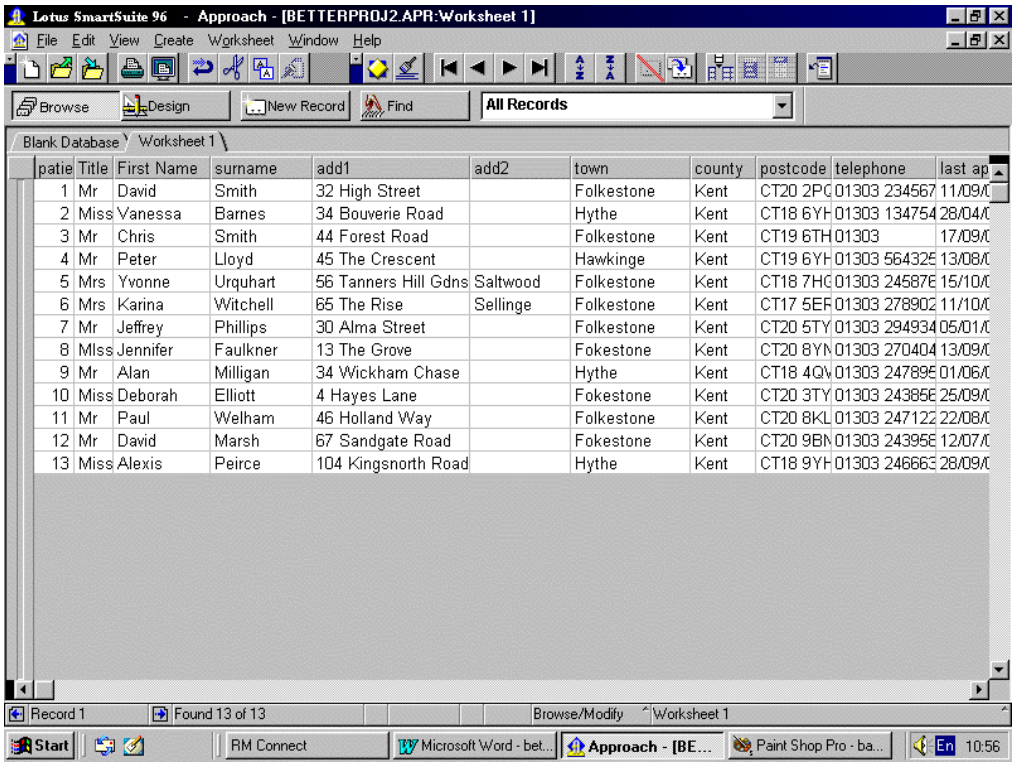


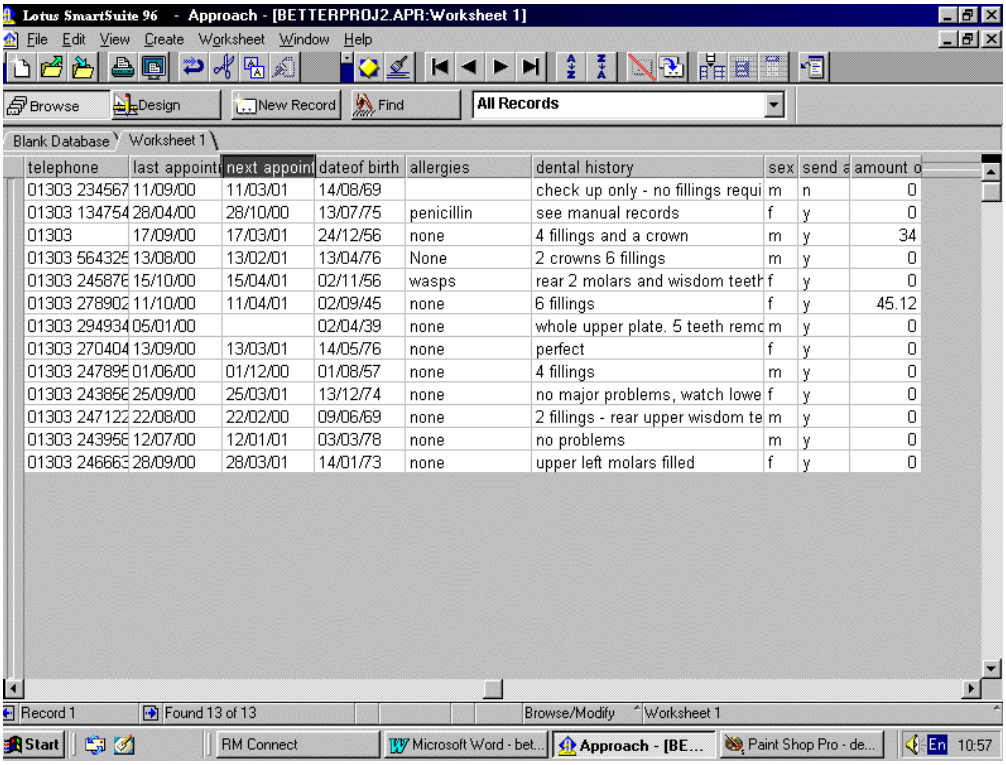
Now that I am happy that the database actually works then we can begin to input some of the database from the dentist so that I can prove to them that the database works. First of all I asked the receptionists to fill in a few data capture forms for me, I have included one example to illustrate that this has been done.

Title: Mr
First Names: Paul
Surname: Welham
Sex: Male
Date of Birth: 09-06-69
Address: 46 Holland Way
Town: Folkestone
County: Kent
Postcode: CT20 8KL
Telephone: 01303 247122

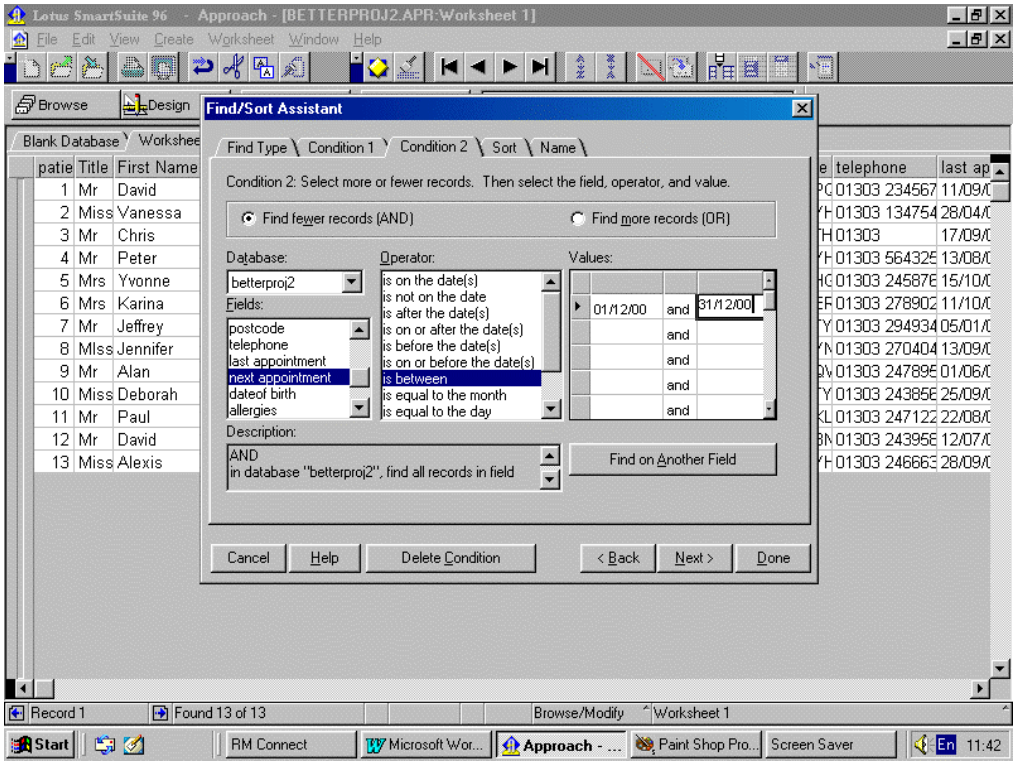
Any known allergies?
None

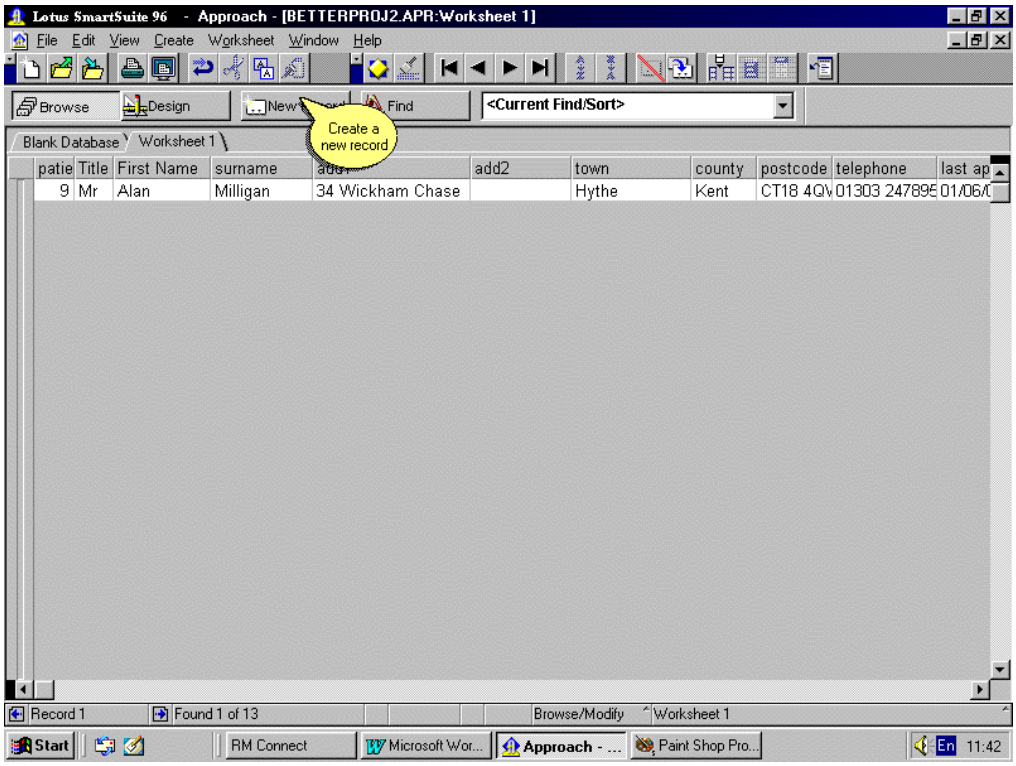
I then put the information that they gave me along with their dental records into my database and have attached the completed worksheet next.





I then ran the searches to prove that the database works, starting with money owing and then to send a letter to all those people who have an appointment next month i.e. December 2000. The screenshots below show this working.





I then printed out the letters which are produced when the searches were done. I have put a copy of the money owing letter and the next appointment letters on the next page.

Robinson Dental Surgery
65 Cheriton Road
Folkestone
Kent
CT19 6TY
01303 256345

26th October 2000

Mr Chris Smith
44 Forest Road
Folkestone
Kent
CT19 6TH

Dear Mr Smith

It would appear from our records that there is a small amount outstanding on your account of £34.

Please call the surgery so that the matter can be settled.

Sincerely yours,

Mr Ian Robinson

Robinson Dental Surgery
65 Cheriton Road
Folkestone
Kent
CT19 6TY
01303 256345

26th October 2000

Mr Alan Milligan
34 Wickham Close
Hythe
Kent
CT18 4QW

Dear Mr Milligan

Just a quick reminder to let you know that you have an appointment with us on 01/12/00.

If there are any problems then please do not hesitate to contact us.

Sincerely yours,

Mr Ian Robinson

I asked the receptionist to complete an evaluation form for me to enable me to find out how to make improvements to the database that I had built. It is shown below:

Agree- ☺ No Opinion- 😐 Disagree- ☹

Does the database work? ☺ 😐 ☹
Comments

Was it any good? ☺ 😐 ☹
Comments

Yes it works well

The layout was easy to understand? ☺ 😐 ☹
Comments

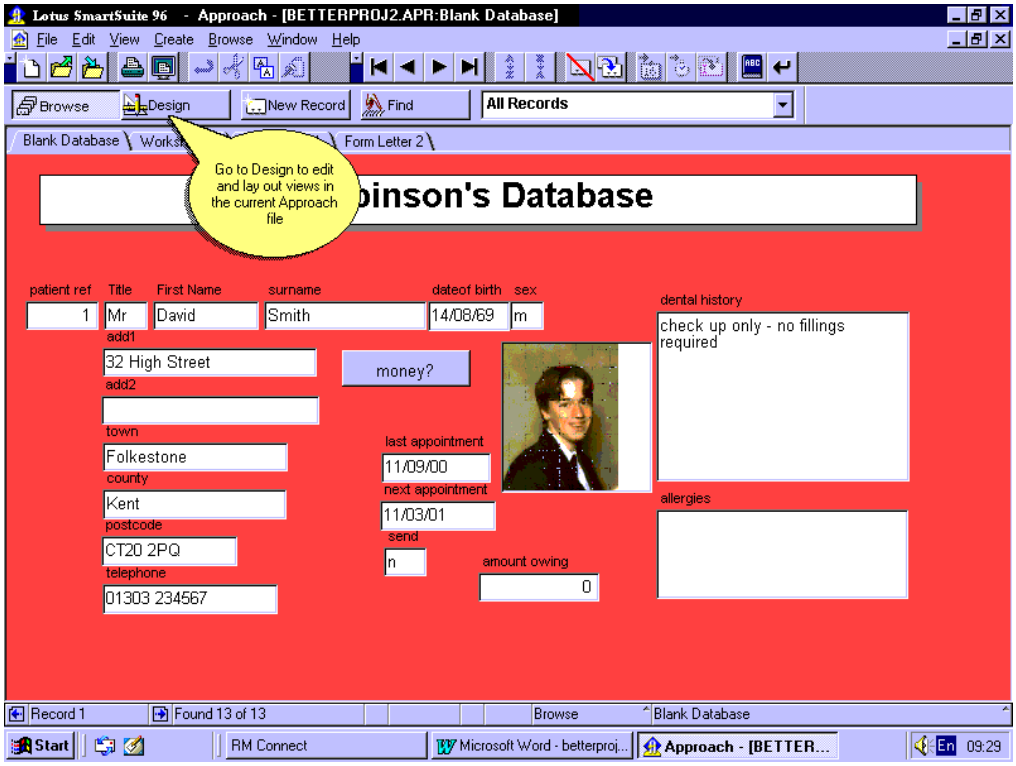
A guide to searching is needed

The database is useful? ☺ 😐 ☹
Comments

Any other comments?

Layout is boring- a picture of the patient would be nice

From the evaluation form we can see that I need to make the database a little bit more interesting in the way that it looks, put in a picture field so that the receptionists can recognise each of the patients and create a brief guide on how to do searches. The guide is on the next page with a screenshot to show that the picture field has been included and the background is now in red.



A guide to completing a search

1. Load up the database
2. Click “find”
3. Click “find assistant”
4. Select basic find (should already be highlighted) and click “next”.
5. Select the field that you want to search on from the left hand list (most likely to be “next appointment”)
6. Select the correct option from the second drop down list (for “next appointment” this will be “is between”)
7. Select the dates that you wish to search between
8. Click done

Marker’s Comments:
The method of using screen shots and pasting them into a word processor is not recommended. It is better to use actual print out and annotate them by hand. Numbering the printouts allows the candidate to demonstrate the correction cycle that should have taken place. The guide for completing the search is not relevant unless it is included as help on the database.

Overall Marking Comments: Implement **(Assuming this is an 'Extension' level project - see overall marking comments on page 44. For a 'Standard' project the maximum mark that could ever be awarded for this section would be 8)**	
Hardcopy	**An inadequate number of hardcopies were present to demonstrate the solution. At least two searches/sorts should have been completed to show different scenarios. Evidence of the macro was missing.**
Correction cycle	**No annotated hardcopies exist to show the correction cycle. It is possible that the candidate got it totally right first time, but it would be very unusual.**
Realistic amounts of data	**Just adequate, around 20 records would have been better.**
Design to Implementation	**Letters were like those in design section, but database screens were different with no reason given for change. (This is mainly due to the lack of detail in the design section).**
Testing	**There is evidence of testing but as no test plan was given in design there are no expected results to compare the hardcopies with.**
Mark: 6/12	

Evaluate

I am sure that my project did work and the people who tried out my database said that it was pretty good. The receptionist said that it was much better than the system that they use already but not quite good enough for the surgery to use in real life. The biggest problem is doing searches that involve dates, as macros can not be recorded to include specific dates so the searches have to be done manually. What I would have liked to create is a couple of boxes to put dates into and then a macro button to run the search from there, I am sure that it can be done but just can't work out how to do it myself.

The original objectives were to:

- *create a database to hold all the records of the people that go to the dentist*
- *make some letters to send to the people who have appointments coming up*
- *work out how my database can be improved*
- *create something that is easy to use for the people who work at the dentists.*

There is no doubt that the database can hold all the records required but perhaps the fields would need to be improved. The "dental history" field is a bit too vague and maybe could be broken down into sub-fields.

The letters worked fine but are very boring in their layout, ideally I would like to have created some headed paper with the dentist's logo on it and their address. This is not possible using Lotus Approach as far as I can work out and perhaps could be solved by the dentist having their own stationery printed up but this would cost a lot of money and it would be easier to use a colour printer that did it automatically.

I have worked out ways in which the database could be improved and did act upon some of the suggestions made by the receptionists. But, as I stated earlier, my gut feeling is that the project is not really good enough to be used in the real world as the printed output is not really of a professional quality and the database itself is a bit limited in what it can do.

Was my database easy to use? Well as I had to create a guide for people to use then I would have to admit that it is not that simple. In the future I would like to create a custom toolbar for the user but I have no idea how to do this. Yes if you can use Lotus Approach then the database is fine to use, but it really does require the receptionists to understand Lotus Approach to use my project to its best ability.

Overall Marking Comments: Evaluate	
Original objectives	**Well evaluated.**
User Feedback	**Present in the design section and mentioned here. Critical and sensible.**
Further enhancements	**Mentioned and sensible.**
Mark: 5/5	

Marking Comments: Overall

This project was just an Extension level project due to the one macro. Although no evidence of the macro code was present, there was evidence of implementation and the production of standard letters.

Process	Mark
Identify (out of 5)	3
Analyse (out of 9)	5
Design (out of 9)	4
Implement (out of 12)	6
Evaluate (out of 5)	5
Total (out of 40)	23

Quality of Written Communication (QoWC*)*

Although this should be awarded across all of the coursework collection, if this was the only piece of coursework completed by this candidate then it should have been awarded a mark in the Level 2 range (see page 15).

Mark: 4/8

Procedures for standardisation of coursework

The specifications contain full details of the procedures for recording and submitting candidates' coursework marks. It is also the responsibility of centres to ensure that where more than one teacher has marked the work, internal standardisation has been carried out. The purpose of this procedure is to ensure that the work of all candidates at the centre is marked to the same standards.

Internal standardisation can be achieved through a variety of methods, but the following procedure is usually both effective and efficient in use of teachers' time.

- Draw up agreed marking guidelines for each coursework problem before marking candidates' work.
- Each teacher marks a sample of six projects - two high standard, two medium standard, two low standard.
- One teacher, acting as standardiser, then re-marks the sample from each person in the team and, where necessary, amends the marks awarded to ensure that a common standard has been achieved and that the work in the sample has been placed in the correct rank order. The standardiser then updates the marking guidelines as necessary and provides these to each teacher along with their re-marked sample.
- Teachers should then be in a position to go ahead and mark the work of all their other candidates, confident that they are marking to an agreed standard.

It is important to note that this process needs to take place for each of the coursework problem types being submitted. It is recommended that each piece of coursework is marked and standardised as soon as the work has been handed in by candidates. This spreads the marking workload and allows any difficulties to be identified and dealt with as early as possible. It also allows feedback to candidates about their progress and makes it possible to identify and deal with those that are under performing.

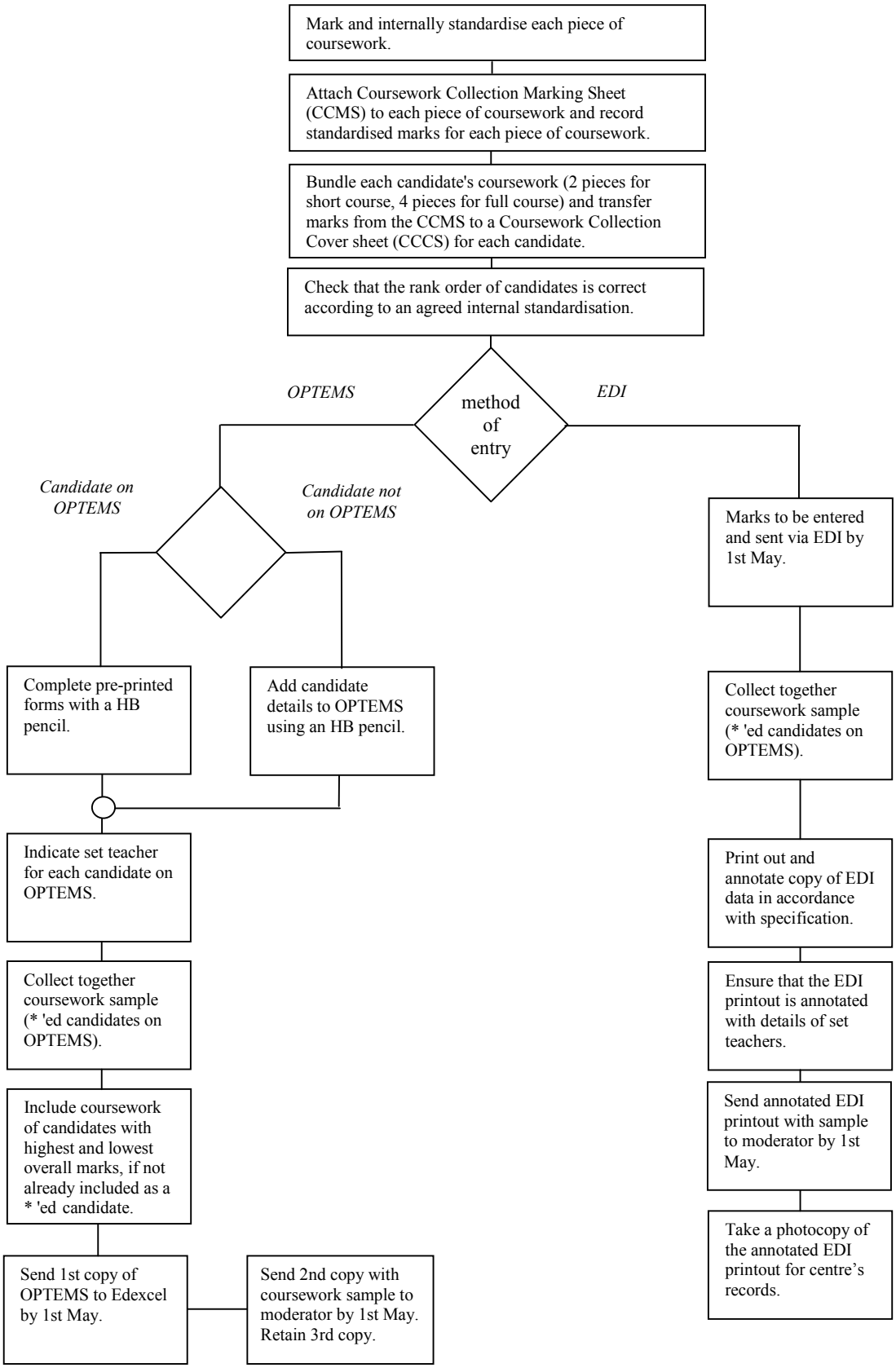
Standardisation that takes place after all the pieces of work for a particular problem type have been marked is a possible alternative method, but it is then essential that once agreement has been reached, the marks for ALL pupils are adjusted accordingly.

As soon as all coursework problems are completed it is recommended that the total coursework scores for all candidates are calculated and a check made that these truly reflect the rank order of the centre's candidates.

The importance of accurate standardisation of coursework cannot be overstated. If the sample of coursework requested for moderation reveals discrepancies in the marks awarded by any of the staff marking the coursework then the marks for all candidates at that centre may be affected. For example if two pupils are given a mark of 85 and their work is not of an equal standard, then both of their marks will either be adjusted up or down. This will have a 'ripple' effect on the rest of the centre's entry, having a greater effect nearer to the problem mark.

Submission process

The flow chart below summarises the procedures for internal assessment, moderation, and submission of coursework marks. Full details are included in the specifications.



Presentation of Coursework

Centres are asked to observe the following guidelines when presenting their coursework sample:

- Ensure that a Coursework Collection Marking Sheet (CCMS 1 for Full Course and CCMS 2 for Short Course) is attached to each individual piece of coursework, with either 'Standard' or 'Extension' **clearly circled** to show the complexity level of the problem.
- Place all the pieces of coursework for a particular candidate together, but ensure that each individual piece of coursework is clearly distinguishable.
- Ensure that a Coursework Collection Cover Sheet (CCCS 1 for Full Course and CCCS 2 for Short Course) is attached to each pupil's collection of coursework. The mark for each project should be again recorded on this cover sheet, as well as the mark given for the Quality of Written Communication exhibited across the four projects.
- Do **not** use ring binders or clear plastic pocket files.
- Use treasury tags rather than staples to hold pieces of work together.
- If the deadline date for submission of coursework marks and sample are not going to be met it is **essential** that centres inform Edexcel of the delay.

The templates for the Coursework Collection Marking Sheets and the Coursework Collection Cover Sheets can be found at the back of the Full Course and Short Course specifications, and should be photocopied by centres.

Incorporating the wider curriculum

Teaching key skills with ICT

By studying this GCSE, pupils will be afforded many opportunities to develop and demonstrate the level 1 and 2 core key skills of communication, information technology and application of number. These key skills are signposted within the specification itself and opportunities are mapped to specific activities there, in Appendix 1.

The specification also signposts opportunities to develop and demonstrate the key skills of improving own learning and performance, working with others, and problem solving.

The table below maps two core key skills with the learning outcomes (LO's) found in the specification.

Specification	Key skill component	Learning outcome
	Communication Level 1	
1185 & 3185	C1.1	LO24
1185 & 3185	C1.2	LO5
1185 & 3185	C1.3	LO5, LO6
	Communication Level 2	
1185 & 3185	C2.1 a & b	LO24, LO36
1185 & 3185	C2.2	LO5
1185 & 3185	C2.3	LO5, LO36

Specification	Key skill component	Learning outcome
	Application of number Level 1	
1185 & 3185	N1.1	LO5
1185 & 3185	N1.2	LO5, LO17
1185 & 3185	N1.3	LO5
	Application of number Level 2	
1185 & 3185	N2.1	LO5
1185 & 3185	N2.2	LO5, LO17
1185 & 3185	N2.3	LO5

Teachers and curriculum managers will be able to use the above to map to see the contribution of this GCSE to key skills.

Students studying for the Full Course (1185) GCSE in ICT can gain **full exemption** from the Level 1/2 IT Key Skill, and those studying for the Short Course (3185) GCSE in ICT **partial exemption**. These proxy arrangements are fully explained in the relevant specification.

Teaching citizenship with ICT

The key concepts of citizenship education include:

- legal and human rights and responsibilities
- national, regional, religious and ethnic identities in the UK
- the work of parliament, the government and the courts
- the democratic and electoral processes
- how the economy functions
- the role of individuals and voluntary groups in social change
- the role of the media in society
- rights and responsibilities of consumers, employers and employees
- the UK and Europe, the Commonwealth and the United Nations
- global interdependence and responsibility.

Many of these can be analysed by research of various kinds, using ICT sources and employing ICT skills and aptitudes developed throughout this GCSE.

This GCSE can contribute to the knowledge and understanding of electoral systems and election polls by learning how to manipulate and present information for a specific target audience. *(These issues are addressed in LO12).*

New ICTs, specifically the Internet, offer the possibility of becoming better informed. The interactive character of the Internet provides opportunities for invigorating education in citizenship. There are some very good UK based web sites that meet key standards of impartiality and comprehensiveness and appear as recommendations by QCA for use in the teaching of citizenship. These include:

- British politics page www.ukpol.co.uk
- Political Science resources www.psr.keele.ac.uk

(These issues are addressed in LO24, LO29, and LO33).

A citizenship subject section is being developed for the NGfL and this will include links to other relevant sites. www.ngfl.gov.uk

The following websites may also be helpful:

- Community Service Volunteers www.csv.org.uk
- Council for Education in World Citizenship www.cewc.org.uk
- Institute for Citizenship www.citizen.org.uk

Teachers and curriculum managers will be able to use the learning outcomes mentioned above to map specific opportunities for citizenship education.

However, it is in the spirit of the specification, that there are many more possibilities. In particular two of the four defining strands of progression are worth consideration for a holistic whole school curriculum approach to citizenship education. These are:

- developing and making things happen
- exchanging and sharing information.

The booklet 'Citizenship at Key Stages 3 and 4; Initial Guidance for School' produced by QCA links the following areas of the key skill of IT with the programme of study for citizenship:

- handling data
- communicating with others
- accessing relevant websites.

The booklet also suggests that links can be made between the following aspect of citizenship and the curriculum for ICT:

- importance of the internet for enquiry and communication.

Moral, ethical, social and cultural issues

The IT skills and aptitudes developed throughout this GCSE are increasingly playing a central role in Cultural and Heritage Informatics. New networks are being created with multimedia and ICT systems. Such developments are enabling new integration between cultural objects in museums, the environments for which they were originally produced, and the knowledge concerning them in libraries and archives.

An excellent and comprehensive resource in this aspect of cultural education is the European Network of Centres of Excellence in Digital and Cultural Heritage and ICT (www.mmi.unimaas.nl).

(These issues can be addressed through LO13, LO19, LO23, LO31, LO33 and LO38).

Wider issues related to the emerging knowledge society, as shaped by cultural content, are common themes in social education- how each culture has its own principles of knowledge organisation, interpretation and expression. Equally significant is the study of the implications of digitisation for the constitution of the information society.

(These issues can be addressed through LO24).

Superficially, the Internet would appear to offer many opportunities for students to research ethics, its use in action for the creation of 'positive' character and the 'advancement of responsible and caring communities'. However, many attractive Internet sites, which purport to be sources of information for teachers and students, are fronts for cults. Extreme caution must be used if the interactive nature of the Internet is to be exploited in the support of ethical education.

Through study of this GCSE a firm grasp of the current and developing ICTs will facilitate informed judgements on moral issues. In particular by studying the Data Protection Act, The Computer Misuse Act, and the Copyright, Designs and Patents Act, some of the moral concerns of a knowledge-based society can be explored.

(These issues are addressed in LO24).

Textbooks and resources

Student resources

Student Handbook for Information Technology Gareth Williams
Pearson Publishing ISBN 1 85749 534 9

Student Handbook Applications of ICT Gareth Williams
Pearson Publishing ISBN 1 85749 577 2
www.pearson.co.uk/education/

GCSE IT Companion Two P Meakin
(disk based 'textbook' with on-line quizzes, worksheets and marking schemes)
Cedar Education- 01925 759 583
www.cedar.u-net.com

Information Systems For You Stephen Doyle
Nelson Thornes ISBN 0-7487-4459-2

Information Systems For You Skill Builder Stephen Doyle
Nelson Thornes ISBN 0-7487-5316-8

Websites

www.freeserve.com/education/examrevision/gcse/it/igtopics.html
www.bbc.co.uk/education/gcsebitesize/information_technology/index.shtml

Teacher resources

ICT Explained Gareth Williams
Pearson Publishing ISBN 1 85749 576 4
www.pearson.co.uk/education/

Understanding Computer Science for Advanced Level Ray Bradley
Nelson Thornes ISBN 0-7487-4046-5

Websites

www.edexcel.org.uk

The Edexcel website contains a dedicated ICT section that can be accessed by following the 'subjects' link on the home page.

www.ictcoordinator.co.uk

Support and training

Website

www.edexcel.org.uk

Please visit the Edexcel website, where further information about training and support for all qualifications, including this GCSE, can be found.

The website is regularly updated, and an increasing amount of support material and information will become available through it.

Edexcel publications

The full examination specification, specimen papers and further copies of this guide can be obtained from:

Edexcel Publications
Adamsway
Mansfield
Notts NG18 4FN

Tel: 01623 467467
Fax: 01623 450481
E-mail: publications@linneydirect.com

Regional offices and Customer Response Centre

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Training

A programme of INSET courses covering various aspects of the specifications and assessment will be arranged by Edexcel each year on a regional basis. Full details may be obtained from:

INSET
Edexcel
Stewart House
32 Russell Square
London WC1B 5DN

Tel: 020 7758 5620
Fax: 020 7758 5951
E-mail: inset@edexcel.org.uk

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