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## Sample Assignment: Unit 17 Program Design, Production and Testing

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### SAMPLE ASSIGNMENT 3

The following set of assignment tasks will allow you to cover all assessment objectives for this unit. You should look at the Assessment Evidence Grid for the unit to find out precisely what you need to demonstrate to achieve each mark band for each task. The assignment contains a Program Requirement and a set of tasks related to that requirement.

#### Program Requirement

A program is required to simulate a snack vending machine. The snack machine will vend crisps at 35p, chocolate biscuits at 40p, nuts at 50p and cereal bars at 55p. The program will run in a continuous loop. At points during the program, a menu will be displayed from which the user can either select a snack, or choose to checkout all snacks selected so far. If a snack has been selected the program will display the snack selected and ask the user to select how many they would like, then it will return to the menu. An entry of 0 will cause that selection to be ignored. The menu will always show all snacks that have been selected so far, with the quantities and the total amount to pay. The user can continue to select snacks until they are ready to buy.

When the user chooses to checkout their purchases, they will be shown a list of the items and quantities they have chosen, a total amount to pay and a request to enter money. Money entry is simulated by the user entering the value of each coin. The machine will accept £10 notes, £5 notes, £2 coins, £1 coins, 50 pence, 20 pence, 10 pence and 5 pence. It must reject entries of all other monetary values except 0 which means that the user would like to cancel the purchase. As soon as enough money has been entered the snacks will be dispensed, one at a time (shown by displaying messages on the screen). If too much money was entered, change will be given.

To maintain the correct working of the machine, the stock of each snack must be continually monitored and occasionally refilled. There will be 50 of each snack loaded in the machine at the beginning of the program. If a user chooses to buy more of a particular snack than is currently present in the machine, the program must tell them and allow them to reselect. The machine is refilled by selecting 0 at the main menu (this option should not be displayed). When 0 is selected the user is asked to enter how many of each snack they are loading into the machine (the total of the amount loaded and the amount still in the machine must not exceed 50).

#### Your Tasks

##### Task a

Produce a program specification to meet the given requirements. Your specification must include:

- A definition of input, processing and output requirements
- A description of how your program definition meets and/or deviates from the given requirements.

### **Task b**

Produce a program design to meet your program specification. Your design must show evidence that you have used a structured design method and must include design of:

- Inputs
- Outputs
- Processes (using appropriate process description methods)
- Data structures.

### **Task c**

Produce a working program to realise your design. Your program must include at least one data structure (e.g. a structure to hold details of the quantity of each snack in the machine or a structure to hold details of all the snacks chosen by the user up to checking out) and must use all data types, control structures and operators listed in the programming section of the unit specification.

Your program listing must be annotated with appropriate comments. You must submit a program listing and screen dumps to illustrate the operation of your program.

### **Task d**

Produce a test plan and a record of testing. Your plan must cover:

- All input data validation
- All user operations
- All paths through the processes.

### **Task e**

Finally, you must collect together the work produced as a result of tasks a to e into one coherent design report. Your report must contain a title page, page numbers, contents page and a bibliography.

Add to your report a review and evaluation of the whole process of design and production of this program. Your report must include:

- A review of your final program against the original program requirements commenting on its ease of use and suitability for users of differing abilities. (for this task you will want to get and record some user feedback).
- An analysis of your design method, identifying its strengths and weaknesses and referring to the ease or difficulty with which it was translated into a working program.
- A description of the problems identified as a result of testing which will require correction.
- An analysis of your performance in completing tasks a to e identifying strengths and weaknesses and suggesting ways in which you might improve your performance in future tasks.

Your review and evaluation should be well structured and you should try to ensure that it is free of errors in spelling, punctuation and grammar.

## Assessment Objectives

Tasks a to e cover assessment objectives and key skills as shown in the table below.

Task	Total marks	Assessment Objectives/Key Skills
a	8	AO1, AO2, AO3, Problem Solving Level 3
b	9	AO1, AO2, AO3, Problem Solving Level 3
c	7	AO1, AO3, Problem Solving Level 3
d	8	AO1, AO3, Problem Solving Level 3
e	18	AO2, AO4, Improving Own Learning Level 3, Communications Level 3