UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For the following qualifications :-

M.A.

Library & Info Studies - L4h3: Advanced Automation: Introduction to Programming

COURSE CODE	: **LAISL4H3**
DATE	: **30-MAY-02**
TIME	: **10.00**
TIME ALLOWED	: **3 hours**

# L.4 (h)(iv) ("Advanced automation: Programming"), 2002

Answer **THREE** questions, of which at least **ONE** is from Section A (questions 1 – 4), and at least **ONE** is from Section B (questions 5 – 8).

SECTION A

1. a) Briefly explain, with the aid of a simple example, what an *event handler* is in JavaScript.

   b) Briefly explain what a *variable* is in JavaScript.

   c) Explain the effect of executing the following statement in JavaScript:

   ```
   var myVar = document.myForm.myInput.value;
   ```

   d) Complete the definition of the JavaScript function `retirementProg()` in the HTML document below so that it gives rise to the following input/output:
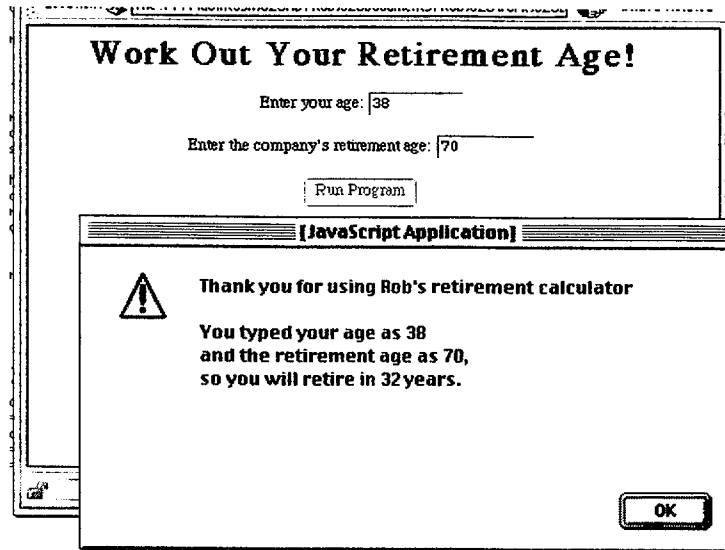

   ```
   <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
   <html><head>
   <title>Work Out Your Retirement Age</title>
   <script TYPE="text/javascript">
   <!-- /* Hide content from old browsers */

   function retirementProg() {
       ..........
       ..........
     }

   // end hiding content from old browsers   -->
   </script>
   </head>
   <body><center>
   <h1>Work Out Your Retirement Age!</h1>
   <form ACTION="none" NAME="ageForm" onsubmit="retirementProg();return false;">
   Enter your age:
   <input TYPE="TEXT" NAME="agebox" SIZE="10" MAXLENGTH="40"><br><br>
   <input TYPE="SUBMIT" VALUE="Run Program">
   </form>
   </center></body></html>
   ```
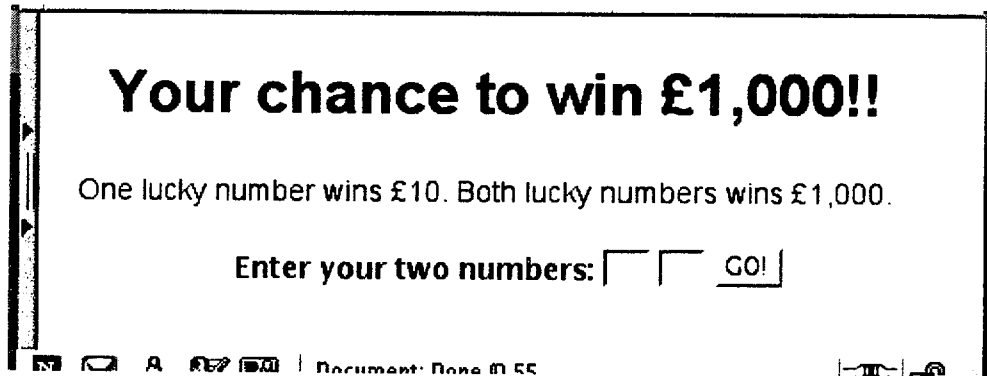
Parts (a), (b), (c) and (d) are worth respectively 20%, 15%, 25% and 40% of the marks for this question.

2. a) Briefly explain the use of *if....else...* statements in JavaScript.

   b) Briefly explain the use of *for...* statements in JavaScript.

   c) Briefly explain the meaning of the operators "&&" "||" and "!" in JavaScript.

   d) The HTML source code of the page

   is as follows:

```
<!doctype HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html><head>
<title>Win £1,000!!</title>
<script type="text/javascript">
<!-- /* Hide content from old browsers */

function luckyNumberProg() {          .

    var firstLuckNumber = 22;
    var secondLuckNumber = 33;
    var firstInput = document.luckyForm.firstNumberBox.value;
    var secondInput = document.luckyForm.secondNumberBox.value;

    add an "if ... else if ... else ..." statement here
}

// end hiding content from old browsers  -->
</script>
</head>
<body><center>
<h1>Your chance to win  £1,000!!</h1>
<p>One lucky number wins £10.
Both lucky numbers wins £1,000.</p>
<form action="none" name="luckyForm" onsubmit="luckyNumberProg();return false;">
<b>Enter your two numbers:</b>
<input type="TEXT" name="firstNumberBox" size="3" maxlength="3">
<input type="TEXT" name="secondNumberBox" size="3" maxlength="3">
<input type="submit" value="GO!">
</form>
</center></body></html>
```

   Add an "if ... else if ... else ..." statement to the function `luckyNumberProg()` so that it outputs an appropriate alert box message ("You've won £1000", "You've won £10" or "Both numbers wrong") according to the user input.

Parts (a), (b), (c) and (d) are worth respectively 15%, 15%, 15% and 55% of the marks for this question

SECTION CONTINUED ON NEXT PAGE

3. a)   Briefly explain what an *array* is in JavaScript.

   b)   Briefly explain how *objects*, *properties of objects* and *object methods* can be created and used in JavaScript.

   c)   Add a "for" loop to the definition of the function `displayEmployees()` in the HTML document below so that clicking on the "Click here to display employees" link gives rise to an alert box output such as the following:
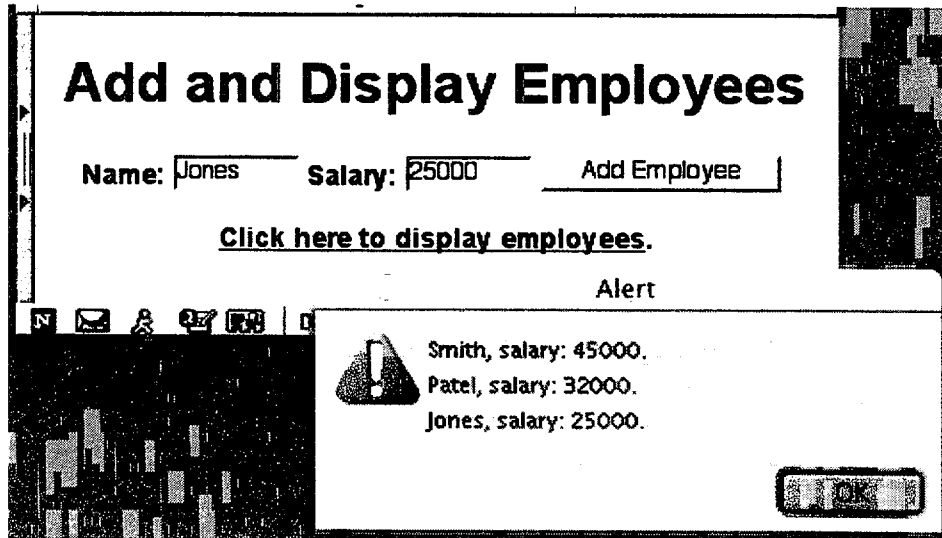

```
<!doctype HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html><head><title>List of Employees</title>
<script type="text/javascript">
<!-- /* Hide content from old browsers */

    var eList = new Array();

    function addEmployee() {
        var index = eList.length;
        eList[index]  = new Object;
        eList[index].name = document.eForm.namebox.value;
        eList[index].salary = document.eForm.salarybox.value;
    }

    function displayEmployees() {
        var message = '';
        add a "for" loop here
        alert(message);
    }

// end hiding content from old browsers  -->
</script>
</head><body><center>
<h1>Add and Display Employees</h1>
<form action="none" name="eForm" onsubmit="addEmployee();return false;">
<b>Name:<b><input type="TEXT" name="namebox" size="10" maxlength="40">
<b>Salary:<b><input type="TEXT" name="salarybox" size="10" maxlength="40">
<input type="submit" value="Add Employee">
</form><br><br>
<a href="nowhere" onclick="displayEmployees();return false;">
Click here to display employees</a>.
</center></body></html>
```

Parts (a), (b), and (c) are worth respectively 20%, 30%, and 50% of the marks for this question

SECTION CONTINUED ON NEXT PAGE

4. a) Briefly explain the use of *functions* in JavaScript.

b) Briefly explain the use of *parameters* in the context of JavaScript functions.

c) Briefly explain the use of *return statements* in the context of JavaScript functions.

d) The rule to convert Fahrenheit to Centigrade is as follows; take away 32, then multiply by 5, and then divide by 9 (for example, 98.6 degrees Fahrenheit is 37 degrees Centigrade). Add a function definition for the function "asCentigrade(...)", which is called from within the function definition of "DisplayCentigrade(...)", to the following HTML document. (The document allows a Fahrenheit value to be entered in a form, converted to Centigrade and the answer displayed in an alert box.)

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<HTML><HEAD><TITLE>Temperature Converter</TITLE>
<SCRIPT TYPE="text/javascript">
<!-- /* Hide content from old browsers */

function DisplayCentigrade() {
        var ftemp = document.tForm.fahrBox.value;
        var ctemp = asCentigrade(ftemp);
        alert(ftemp + ' Fahrenheit is ' + ctemp + ' Centigrade.');
}
```

add definition for the function "asCentigrade(...)" here

```
// end hiding content from old browsers  -->
</SCRIPT>
</HEAD>

<BODY><CENTER>
<H1>Temperature Converter</H1>
<FORM ACTION="none" NAME="tForm" onsubmit="DisplayCentigrade();return false;">
<FONT SIZE="+2">Enter temperature in Fahrenheit:</FONT>
<INPUT TYPE="TEXT" NAME="fahrBox" SIZE="10" MAXLENGTH="40"><BR>
<INPUT TYPE="submit" VALUE="Convert">
</FORM></CENTER></BODY></HTML>
```

e) In a certain company, employees earning over £40000 get a Christmas bonus of one fifth of their wage, whereas other employees get a bonus of one tenth of their wage. Write a definition for a JavaScript function "ChristmasBonus(...)" which takes a (whole number) salary as an argument and returns the corresponding bonus as an answer.

Parts (a), (b), (c), (d) and (e) are worth respectively 15%, 15%, 15%, 25% and 30% of the marks for this question

SECTION B

5. Explain with examples how Client Side JavaScript can be used to control frames, browser windows and images, and dynamically generate HTML pages.

6. What are the three basic types of Internet search engine? Explain how each of them works, and the relative strengths and weaknesses of their mechanisms for effective Internet information retrieval.

7. Describe the different types of virus you might find in an infected computer system, their basic functioning, and the mechanisms you might use to achieve a cure and prevent further infection.

8. You have been asked to create a website for a library, archive or record center with which you are familiar. Discuss the design considerations involved. What might be the important factors in designing a "good" website?

END OF PAPER