HETAC

ICT

OOP2 2015 EXAMINATIONS

Module Code: **ICT B8IT057**

Module Description: **Object Oriented Programming 2**

Examiner: **Damien Kettle & Harnaik Dhoot**

Internal Moderator: **Shazia Afzal**

External Examiner: **Pat Donnelly**

Date: Wednesday, 1st April 2015
Time: 09:30 – 11:30

INSTRUCTIONS TO CANDIDATES:

Time allowed is 2 hours.

QUESTION 1   IS COMPULSORY

Answer any 2 other questions.

Question 1 – Compulsory – 50 Marks

You have been asked to develop an Employee Management System for Simmons Engineering. When the application is run a list of Employees must be displayed to the user in a grid format. The software must allow users to enter details relating to a new Employee in addition to updating existing employees and removing an employee from the system.

A sample of the data relating to an Employee can be found in the table below:

Emp Number	First Name	Surname	County	Country	Department
1712345	Joe	Smith	Dublin	Ireland	Sales
1712346	Mary	Jones	Galway	Ireland	Accounts
1712347	John	Doe	Donegal	Ireland	Sales

The application must be developed using C#, Windows Forms, SQL Server and ADO.Net. It is not a requirement to build a business or data layer for this solution.
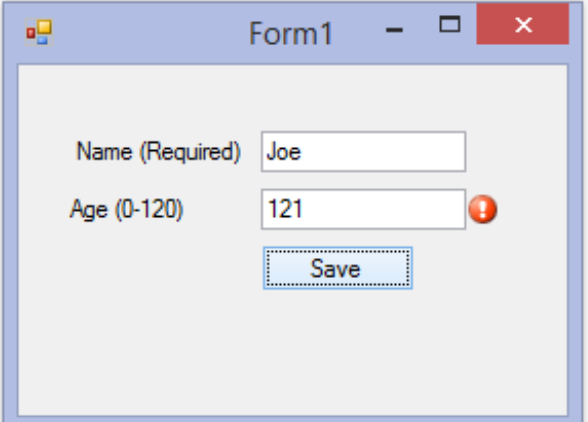
You are required to provide the following code:

   I.   SQL for all database objects
- a) SQL Tables on Local or SRV09 database **(7 Marks)**
- b) Emp Number as Primary Key (auto incrementing) **(3 Marks)**

  II.   Design and layout of your Windows Form.

- a) Use of buttons or menu items to add, edit and delete an employee and their related screens **(10 Marks)**
- b) Use of a DataGridView control to display employee details to the user. The following columns must be shown in the grid **(5 Marks)**:
  - i. First Name
  - ii. Surname
  - iii. Emp No.
  - iv. Department
- c) A means to update the DataGridView when a employee is either added, removed or updated. **(5 Marks)**

  III.   The connection string used to connect to the database must be stored in an App.config file. **(5 Marks)**

  IV.   You are required to make use of ADO.Net objects (**10 Marks**)

  V.   Coding standards must be adhered to as well as effective exception handling. **(5 Marks)**

(50 marks)

Question 2 - 25 Marks

Create the following Windows Form

You are required to provide the following:

   I.   Form Creation using the ErrorProvider component (disable auto validate).
        (3 Marks)
  II.   The Name Field will be validated, set an error if empty *"Please enter a name".*
         (5 Marks)
 III.   When validating the Age Field, set the error *"Age must be between 0 and 120"*
         (7 Marks)
 IV.   When validating the Age Field, set the error *"Age must be a number"*
        (5 Marks)
  V.   Create a button on the UI which when clicked will display a message box displaying a
        "Saved" if correctly validated.
        (5 Marks)

(25 marks)

Question 3 - 25 Marks

Create a Windows Form application which serialises an Employee C# object. The form must allow the user to enter the following employee details:
- i. First Name
- ii. Surname
- iii. Employee Id
- iv. PPS Number

I. Create a UI which allows the user to display the details listed above.
(5 Marks)

II. Using the following requirements write C# code which determines if the data entered by the user is valid. All validation rules should be stored in an App.config file. The validation should be performed before serialising the C# object to XML. The user should be informed if the data is invalid.
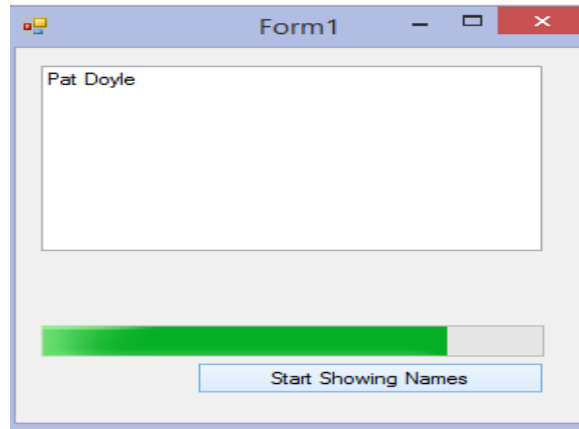
Property	Validation Rule	Marks
First Name	Must be at least one character in length	**(2 Marks)**
Surname	Must be at least three characters in length	**(2 Marks)**
Employee Number	Must conform to the following pattern EMPnnnnn where -1<n<10. You must use the regular expression ^EMP\d{5}	**(4 Marks)**
PPS Number	Must conform to the following pattern nnnnnnnA where -1<n<10 and A is any uppercase letter between A and Z. You must use the regular expression ^\d{7}[A-Z]$	**(4 Marks)**

III. If the data entered by the user is valid, display a SaveFileDialog to allow the user to select a location to store and name the serialised object.
(**8 Marks**)

(25 marks)

Question 4 – 25 Marks

Create a windows form which iterates through a string array of names and displays each string in a text box for 5 seconds. After the 5 seconds have elapsed the next name in the array should be displayed for another 15 seconds, until all the names in the array have been displayed to the user. **(10 marks)**

a. You should use a textbox, progress bar and background worker control as part of your design. **(3 Marks)**

b. When the application loads it should create a thread to process each string entry in the string array. The tread should pause for 5 seconds after each element of the array has been assigned to the text property of the textbox. **(7 marks)**

c. You should update the progress bar to indicate what percentage of the array has been processed at any given time **(5 marks)**

(25 marks)