Dublin Business School

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HETAC

ICT SKILLS PROGRAMME – SOFTWARE DEVELOPMENT

JANUARY 2013 REPEAT EXAMINATIONS

Module Code:　　**ICT1719**

Module Description:　　**Object Oriented Programming 2**

Examiner:　　**Kevin Coady**

Internal Moderator:　　**Paul Kelly**

External Examiner:　　**Professor John Rees**

Date:　　*Saturday, 11ᵗʰ January 2012*
Time:　　*10am to 12pm*

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 a DVD Rental Management System for a local Dublin business. When the application is ran a list of DVDs must be displayed to the user in a grid format. The software must allow users to enter details relating to a new DVD in addition to updating existing DVDs and removing a DVD from the system.

A sample of the data relating to a DVD can be found in the table below:

Movie Title	Production Year	Rental Cost (euro)	Director	New Release	Genre
The Dark Knight Rises	2012	5	Christopher Nolan	Yes	Action
Johnny English 2	2011	4	Oliver Parker	No	Comedy

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 source code:
  I. SQL for all database objects
        a) SQL Tables **(3Marks)**
        b) SQL Stored Procedures **(7 Marks)**
  II. Design and layout of your Windows Form.
        a) Use of buttons or menu items to add, edit and delete a DVD and their related screens **(10 Marks)**
        b) Use of a DataGridView control to display DVD details to the user. The following columns must be shown in the grid **(5 Marks)**:
              i. Movie Title
             ii. Production Year
            iii. Rental Cost
        c) A means to update the DataGridView when a DVD 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

A local Car Dealership has asked you to provide a Car Lookup System. The following is a sample of the data used for a car:

Make	Model	Number Of Kilometers	Price	Registration Year
Ford	Focus	10000	20000	2012
Opel	Astra	40000	11600	2007
Renault	Megane	102000	6500	2007

You are required to provide the following:

NOTE you are NOT required to use ADO.Net or store any data in a SQL Database. You can simply hard code sample Cars in your C# code

I. Provide an object which represents a Car entity. **(3 Marks)**
II. A Windows form containing a DataGridView which displays a list of Cars. **(5 Marks)**
III. Create a LINQ query which allows the user to search the list of Cars for a Make or Model. **(7 Marks)**
IV. Using the LINQ query you created in part III above, you should provide a textbox on the UI to allow the user to type in the search query. As the user types text into the textbox the data in the DataGridView must be updated if any Cars match the query. **(5 Marks)**
V. Create a button on the UI which when clicked display a message box displaying the average cost of all cars in the dealership. You must use a LINQ query to calculate this. **(5 Marks)**

(25 marks)

Question 3 - 25 Marks

Create a Windows Form application which serialises a Student C# object. The form must allow the user to enter the following student details:

      i.   First Name
     ii.   Surname
    iii.   Student Id
    iv.   Student 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)**
Student Number	Must conform to the following pattern 17nnnnn where -1<n<10. You must use the regular expression ^17\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

I. Write a note on TWO of the following topics in relation to Threads: **(10 Marks)**

  a. Thread Priority

  b. Join and Sleep

  c. Thread Blocking

II. Create a windows form which iterates through an array of names and displays each string in a text box for 10 seconds. After the 10 seconds have elapsed the next element in the array should be displayed for another 10 seconds, until all the elements in the array have been displayed to the user.

  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 10 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)