National College of Ireland

National College of Ireland

BSc (Hons.) in Computing Year 1 BSHC1 BSHCE1
BSc (Hons.) in Business Information Systems Year 1 BSHBIS1 BSHBISE1
Higher Certificate in Computing (Applications & Support) HCC1 HCCE1

Semester Two Examinations – 2010/11

Monday 9th May, 2011
10.00 am – 12.00 pm

Object Oriented Programming

Dr. Orla Lahart
Dr. John Ghent
Mr Tom Nolan
Mr Ciaran O'Leary

Answer 1 Question

Duration of exam: 2 hours
Instructions: Students may develop their solution using NetBeans or Textpad. This exam is open book, where, open book refers to having access to your home drive, which may contain lecture notes, assignments, laboratory exercises, books. In addition, you may access Moodle. Open book does not include Internet access.
Submission: Exam documents should be created directly on the mapped network drive labelled with the Exam name and your student id. Exam documents must also be placed in a zip file labelled with the Exam name and your student id, which, should be submitted through the OOP module page in Moodle.

Question 1

An address book application will be developed to keep track of the names, addresses, phone numbers and email addresses of your contacts. The application should be able to handle a maximum of 100 entries. The Person class, which can store a name, address, phone number and email address, is available from the OOP module page on Moodle.

1. Design and develop a Graphical User Interface (GUI) for this application. The interface should comprise the necessary Swing objects to allow the user to enter all necessary information (name, address, phone number and email address) and two buttons, load and save.

(20 marks)

2. Provide the code to declare and create an array of Person objects. Also, develop the actionPerformed method for the load button. When the user presses the load button the information entered through the GUI should be loaded into this array.

(25 marks)

3. Develop the actionPerformed method for the save button. When the user presses the save button the contents of the array should be written to a file called contacts.txt.

(25 marks)

4. Develop the Friend class which extends the Person class and add a data member and the necessary methods to the Friend class to store your friend's birth date (use a String). Modify the GUI so that a user can specify if the entry is for a contact or friend. If the entry is for a friend they should also be provided with the opportunity to enter the birth date.

(30 marks)

Question 2

Create a Tic Tac Toe game. In this game two players alternate between placing X's and O's into a grid until one player has three matching symbols in a row, horizontally, vertically or diagonally. Create a game in which the user is presented with a three by three grid containing '–''s. As each player chooses a position by entering the row and column value, place an X or O as appropriate in that position. Do not allow a player to place a symbol where one has already been placed.

1. Design and develop a Graphical User Interface (GUI) for this application. The interface should comprise the necessary Swing objects to display the Tic Tac Toe board and to allow players to choose a position by entering the row and column value.

(20 marks)

2. Provide the code to declare and create the two-dimensional array and initialise each element of the array with a '-'.

(20 marks)

3. Develop the actionPerformed method(s) so that as each player chooses a position by entering the row and column value, an X or O as appropriate is placed in that position. Do not allow a player to place a symbol where one has already been placed.

(30 marks)

4. The Instructions class is available to download from the OOP module page on Moodle. Define the TIcTacToeInstructions class that extends the Instructions class to provide suitable instructions for playing the Tic Tac Toe Game. Show how the TicTacToeInstructions class could be invoked by the user pressing a button on the main Tic Tac Toe GUI. The instructions are as follows:

   "The Tic Tac Toe game is a two player game, where players alternate between placing X's and O's into a grid until one player has three matching symbols in a row, either horizontally, vertically or diagonally. Each player chooses a position by entering the row and column value, a X or O is placed in the position as appropriate. A player cannot play in any position which is already played in."

(30 marks)

Question 3

An application will be developed that requires a secure login. Using a text editor, create a comma-delimited file of user IDs and passwords (call it loginDetails.txt). If the user enters a correct ID and its associated password they should receive a 'login successful' message alternatively they should receive a 'login unsuccessful' message.

1. Design and develop a GUI for this application. The interface should comprise the necessary Swing objects to allow the user to enter a username and password and a button to activate the login process.

(20 marks)

2. Give the code to declare and create a two-dimensional String array to store the valid ID and passwords. Populate the array with the data from the text file (loginDetails.txt).

(25 marks)

3. Develop the actionPerformed method that compares the users log-in details to the array of valid ID and passwords to identify if the user has enter a valid ID and its associated password.

(25 marks)

4. Design, develop and invoke the LogInMessage class. The LogInMessage class extends the Message class, which is available from the OOP module page on Moodle, and provides a suitable message for the user stating whether the login was successful or unsuccessful.

(30 marks)