Institute of Technology Tallaght, Department of Computing

B.Sc. (hons.) in Computing

2018/2019

EAD1

CA1

Value: 30%

18/10/2018

Duration: 1 hour and 45 minutes

Type: in-lab, open-book

Lecturer: Gary Clynch

**C#**

A system is required which performs a lottery function i.e. draws a set of random numbers between 1 and a specified maximum number, the number of numbers to be drawn is specified as an input also.

For example in the Irish Lotto, the maximum number is 47, and a draw will draw 6 random unique numbers between 1 and 47.

**Tasks:**

1. Design and develop a LotteryDraw class to represent the results of a lottery draw:
   1. Add a field to store the numbers drawn and a corresponding read-only public property.
   2. Add a field and corresponding read-write property to the class to store the maximum number that can be drawn (e.g. 47 in the Irish Lotto), the set block should be only be able to be called within the class. Validate inputs.
   3. Add a constructor to the class which initialises the maximum number that can be drawn.
   4. Add a method which draws the numbers randomly and stores them in the field defined above. The method should take as input the number of numbers to draw (e.g. 6 in the Irish Lotto). The method should draw the numbers ensuring no duplicates and sort them at the end in ascending sequence. The length of the collection should correspond to the number of numbers drawn. Validate inputs.
   5. Override ToString to return an appropriately formatted string containing full information about the draw i.e. max and the numbers drawn.
2. Design and develop a LotteryDrawHistory class which can be used to record a history of draws made for the same type of lottery (i.e. with same maximum number and number of numbers drawn), this could be used to analyse the results of previous lottery draws:
   1. Add a read-only property and corresponding field to store the history of lottery draws (a collection).
   2. Add a method which adds a new LotteryDraw object into the history if it is for the same type of lottery draw (with respect to maximum number and numbers of numbers to draw for the first draw in the history).
   3. Add a method which trawls the history to find out and report the most frequently drawn number (don’t deal with the situation where there is a tie for the most frequent)
3. Use a test class to test the above logic. Make 5 different draws and store them in a history. Find out the most frequently drawn number in the history.

**Deliverables**:

1. ZIP project and upload to Moodle
2. Demo of code running or whatever has been achieved
3. Hand in hard copy of source code