

# ICS4U Object Oriented Design Assignment

Marks: 20

For each of these questions create the class described and create a program to test the class. Add whatever constructors and accessors that are appropriate for each class. Make sure your access specifiers are set correctly for all fields and methods.

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1. Create a StudentRecord class that would be used by a marks manager program to keep track of students.

(10 marks)

## ***StudentRecord***

**marks** – an ArrayList<Double> of marks received so far.  
**name** – Student's name

**average()** – return the mean of the marks

**median()** – return the median mark

**mode ()** – return the mode of all the marks.

**hasImproved ()** – returns true if the last evaluation is greater than the average, false otherwise.

**addMark(mark)** – add a mark to the list of marks.

**toString()** – return basic details as a string.

2. Create a class called GameWord that is designed to be used in a variety of word games.

*1 point:* **E, A, I, O, N, R, T, L, S, U**

*2 points:* **D, G**

*3 points:* **B, C, M, P**

*4 points:* **F, H, V, W, Y**

*5 points:* **K**

*8 points:* **J, X**

*10 points:* **Q, Z**

(10 marks)

## ***GameWord***

**contents** – a basic String

**reverse()** – return a String with the letters reversed

**anagram(otherWord)** – returns true if the current word could be re-written as the other word. You must overload this method to allow a String or a GameWord to be used as the parameter.

**pointValue()** – returns the pointValue that the current GameWord would be worth in Scrabble ignoring any special squares. The table of values is seen to the left.

**permutations()** – return an ArrayList of all possible arrangements of the word. You will need to use recursion to solve this one.

**toString()** – just returns the string contents.