Heriot-Watt University

School of Mathematical and Computer Sciences

Software Engineering 4 (F22HX3)

Assignment (Part 1): A Programming Exercise

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1 Introduction

Your task is to implement a *triangle classification* program. The specification for the program is given below:

Input: A file called `sizes.dat` containing a single integer N, followed by N integer triples. All integers are separated by spaces.

Example (input):
```
3
3 4 5
6 1 6
5 1 2
```

Behaviour: Determine whether or not each of the N integer triples defines a valid triangle, *i.e.* where each integer denotes the size of one of the sides of a triangle.

If the input does define a triangle then classify it according to the length of its sides as *scalene* (no sides equal), *isosceles* (two sides equal), or *equilateral* (all sides equal).

In addition, if a triangle is defined then classify it according to the largest angle as *acute* (less than 90°), *obtuse* (greater than 90°), or *right* (exactly 90°).

Output: Write to an output file, *i.e.* `results.dat`, each of the integer triples provided as input together with their classification. In the case where the input does not define a triangle then display on standard output the message `NOT A TRIANGLE`.

Example (output):
```
3 4 5   Scalene    Right
6 1 6   Isosceles  Acute
5 1 2   NOT A TRIANGLE
```

2 Implementation

Your program **must be** implemented in Java. The triangle classifier **must be** implemented as the `main` method associated with a Java class called `TriClass`. You may use predefined classes, *e.g.* `Math`.

3 Deliverable

The source code for your program should be emailed to `a.ireland@hw.ac.uk` by **5pm on Tuesday, May 3rd 2005. Please include your surname in the subject header of the email.** Note that Parts 2 and 3 of the assignment depend upon Part 1, *i.e.* if you do not submit a program for Part 1 then you will **not** be able to attempt Parts 2 and 3. Moreover, in order to obtain a grade for the assignment **ALL PARTS OF THE ASSIGNMENT MUST BE ATTEMPTED**. Collectively, the three parts of the assignment count towards 25% of the final assessment of this module.

Note that this is an individual project which means that your solution MUST be your own work.