SCIT

School of Computing and Information Technology

ASSIGNMENT 3
CSIT111– PROGRAMMING FUNDAMENTAL
Session 3 – July to September 2021

INSTRUCTIONS TO CANDIDATES

1. The assignment consists of two parts. This is the part 1 of the assignment.
2. Part 2 is Moodle quiz. Should be done in class.
3. The name of the program must be **YourName_A3.**java (Only one file)
4. Total mark of Assignment 3 is 8 marks; 3 marks for Part II.

Your program, should begin with

// Full Name:
// Part time or Full Time
// Tutorial Group
// Declaration: …… tell me if it is your own work …. And whether you have
// passed your program to your friends or have referred someone's work

Objectives

- Selection and Repetition control structures
- Classes and objects
- Instance and static methods
- The use of arrays and ArrayList's

Task: (5 marks)

Have you ever watched the Olympics and wondered how they come up with the scores for the diving competition? It takes several steps to get from the judge ratings to the final scores, and the announcers are rarely eager to explain it.

Write down the execution scores. Each judge rates the dive from 0 ("completely failed") to 10 ("excellent"). This is based on how well the diver performs, from his

starting position to entry into the water. The judges do not take difficulty into account for this score.

- Example: a diver receives execution scores of 6.5, 7.0, 7.0, 7.5, 7.5, 8.0, and 8.0.

Cross out the outliers. This step depends on how many judges there are:

- **Seven judges:** Cross out the two highest and the two lowest scores.
- **Five judges:** Cross out the highest and lowest scores.
- **Three judges:** Use all three scores.
- Example: There were seven judges, so cross out two scores on each end: ~~6.5~~, ~~7.0~~, 7.0, 7.5, 7.5, ~~8.0~~, and ~~8.0~~.

Add the rest together. Find the sum of the remaining scores.

- Example: 7.0 + 7.5 + 7.5 = 22.0

Multiply by the degree of difficulty (DD). Each attempted dive has a degree of difficulty calculated in advance. This is based on many factors, such as the number of twists and somersaults and the take-off and entry positions. Multiply your last sum by the degree of difficulty to get the final score for this dive.

- Example: Let's say the diver attempted an inward 2½ somersault dive in the 10 meters competition, in the pike position. This has a difficulty score of 2.8. Multiply this by the execution score to get the final score: 22.0 x 2.8 = **61.6**.

Let us look at the UML diagram for this assignment:

Three classes:

- A class to describe a Country: name of the country, name of the player and the player's age.
- A class to describe a Diving: A constant SIZE (no of judges), the name of the country, the scores given by all judges and the degree of difficulty. The scores of the judges will be generated inside this class. Most of methods are obvious in definition.
- In main class, you define a array of countries to be used in the design. The countries can be duplicated.

Let us look at the result (upon execution of your program):

The system, firstly, displays the starting position of each divers:

```
Starting position

Country         Diver       Age         Difficulty
Singapore       Name 1      23                 4.9
China           Name 2      23                 3.6
Thailand        Name 3      19                 3.1
China           Name 4      19                 4.3
South Korea     Name 5      18                 2.3
Japan           Name 6      17                 4.5
USA             Name 7      15                 4.8
France          Name 8      18                 3.5
Germany         Name 9      22                 3.7
Australia       Name 10     21                 3.1
```

After one round of diving, the system display the summary results:

```
Countries       J1    J2    J3    J4    J5    J6    J7    J8    J9   J10  Difficulty    Final
Singapore      4.1   0.6   4.6   2.9   2.7   7.4   0.3   6.8   7.1   3.9         4.9   123.12
China          7.0   7.7   5.0   2.6   6.4   4.6   8.3   6.5   1.6   9.3         3.6   134.68
Thailand       7.1   4.7   1.6   9.5   4.4   1.8   2.5   2.2   8.5   7.4         3.1    87.08
China          9.9   9.5   5.0   9.8   2.3   5.8   8.7   4.1   0.5   6.4         4.3   169.61
South Korea    9.5   4.8   9.6   8.6   2.0   9.4   9.1   7.5   6.3   1.9         2.3   106.35
Japan          3.3   5.7   1.6   5.3   0.8   4.5   9.3   1.8   3.3   6.0         4.5   109.09
USA            4.4   6.1   5.3   4.4   0.8   3.1   3.0   4.5   4.3   1.6         4.8   114.52
France         4.3   1.8   6.4   0.2   6.0   0.6   5.3   3.5   2.9   6.7         3.5    83.38
Germany        8.3   4.4   7.6   2.8   1.3   6.5   1.4   5.7   4.1   9.0         3.7   116.23
Australia      3.0   8.5   6.6   8.5   3.5   5.9   9.8   8.7   0.9   5.6         3.1   119.93

The result is
The Champion:   Name 4, China
1st runner up:  Name 2, China
```

A few important tasks to be done in the main class:

- To construct a list of Country objects
- Some methods to generate for example the degree of difficulty (between 2 to 5), the age (between 15 to 30)
- A method to display the game info (starting position)
- A method to display the result.
- A method to get the champion
- A method to get the 1st runner up.

Convenient to your design, feel free to amend the suggested methods.

IMPORTANT

The name of your program must be exactly **YourName_A3.java** and make sure that this file can be compiled and can be executed. Upload **ONLY** this file to Moodle**. ALL ZIP FILE SUBMISSION WILL BE REJECTED.** You don't have to upload the data file as you will demo to me.

No re-submission will be allowed after grading.

In the above file, remember to put down your name and also the following declaration (some similar contents):

// Tell me if it is your own work, and whether you have passed your
// program to your friends etc etc etc
// and willing to accept whatever penalty given to you.

- **Wrong file name -0.2 mark**
- **No declaration, no name etc -0.2 mark**
- **No demo -0.5**