SCIT

School of Computing and Information Technology

ASSIGNMENT 3
CSIT111– PROGRAMMING FUNDAMENTAL
Session 3 – July to September 2022

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_No_A3.**java (Only one file), **No** is your class list number.
4. **Total mark of Assignment 3 is 10 marks; 4 marks for Part II.**

Your program, should begin with

// Full Name:
// Java version: what version of Java you used for this assignment
// Class List No: (-0.1 mark if no class list no)
// 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

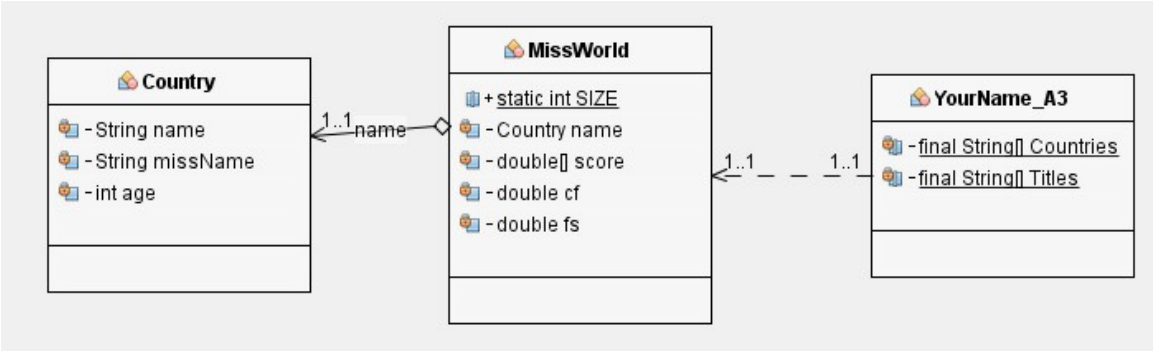
- Selection and Repetition control structures
- Classes and objects
- Instance and static methods
- The use of arrays and ArrayList's

Task: (6 marks)

I like to watch the Miss or Mr. World TV program. When you see the most beautiful ladies or the most handsome men in the world walking and showing off their beautifulness on stage, how nice! Of course, judges play an important role in the competition. The judges enter their scores secretly to the computer system; usually some best and some lowest scores are eliminated; the sum of the un-eliminated scores is the score of the competent.

In this assignment, we will design a system for the Miss World competition. Miss World competition involves three qualifying rounds: interview, swimsuit, and evening gown competitions. The best 5, probably, will enter the final round to decide the final winners; but we are only interested in the qualifying round for this assignment to decide the ranking of all the beautiful ladies representing their countries.

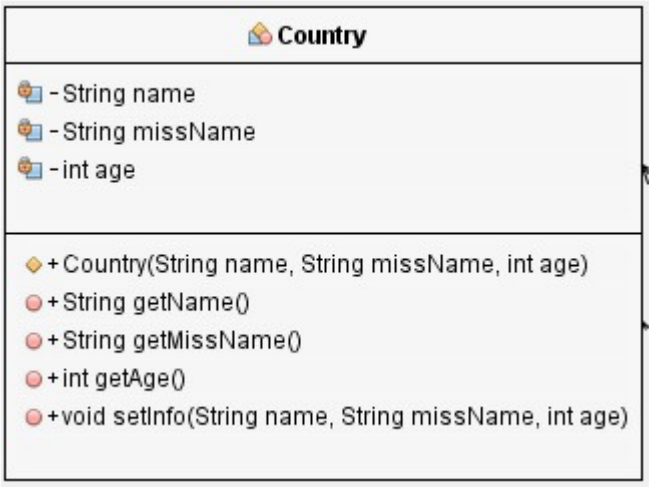
Let us look at a simple UML diagram for this assignment:



Three classes: `Country` class, `MissWorld` class and a main class. We will look at their details later. Convenient to your design, additional class(es) and methods is / are allowed; additional instance variables ARE NOT ALLOWED.

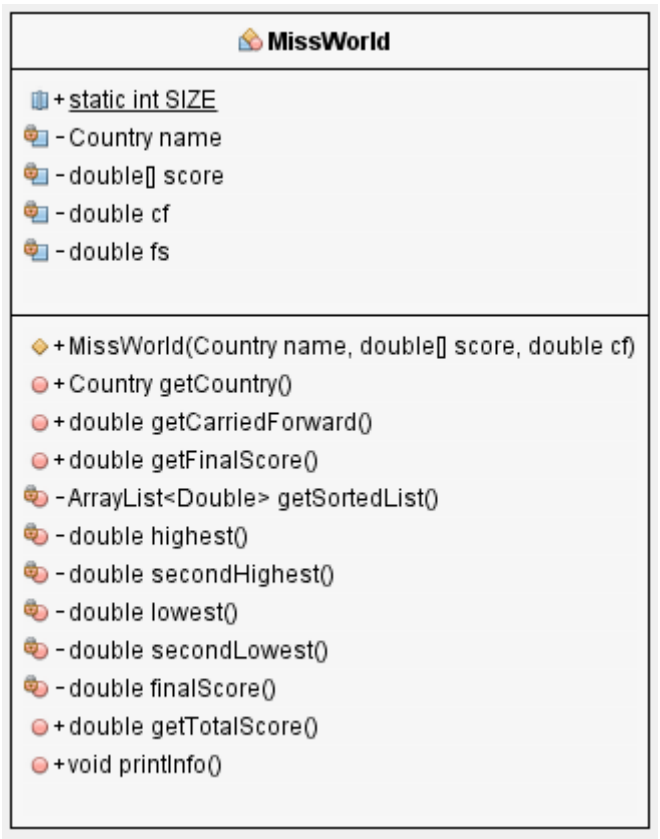
Let us now look at the detail of each class. Basically each class has private instance variables, constructors, accessor methods, mutator methods and some other methods related to the class(es). Methods are either public or private; *you should specify them clearly in your implementation.*

Let us start with the `Country` class:



It is a simple class consisting of three private instance variables: `name` (of a country), `missName` (name of contestant) and `age` (of contestant). A constructor to initialize the instance variables, some accessor methods and a mutator method. Additional methods are allowed. Additional instance variables or any change to instance variables are not allowed.

Next, let us look at the `MissWorld` class which is the most important class of this assignment:



This class has a constant `SIZE` indicating the number of judges, usually is `10`. By specifying it as a constant should one day we want to increase or decrease the number of judges, we just need to change its value (I will test it in marking your assignment).

The class consists of 4 private instance variables: `name` (a `Country` object), `score` (an array, scores given by judges, each value is less than 10 with two decimal places), `cf` (carried forward derived from the previous round, obviously starting round has no carried forward score, i.e. 0.00) and `fs` (the final score of the current round).

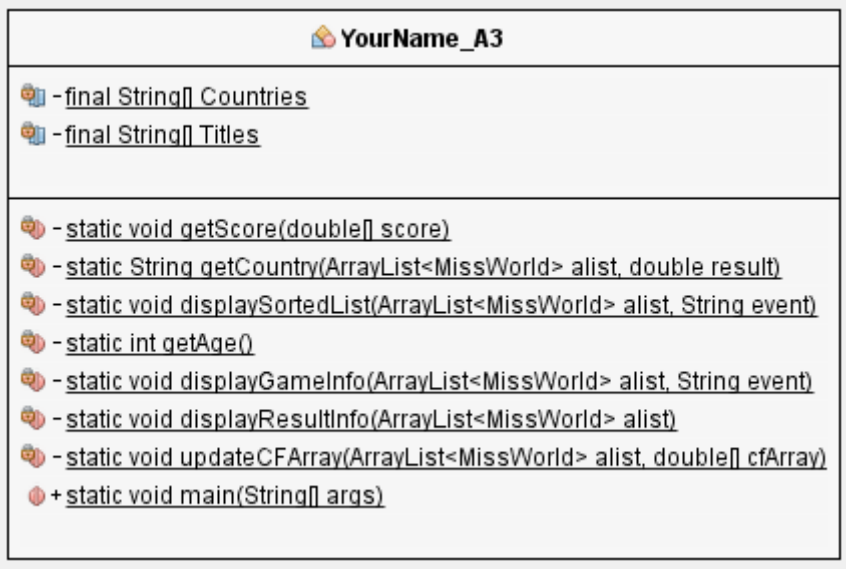
The `getSortedList` stores the scores in a list (a dummy list) and sort it; you can use it to retrieve the highest, second highest etc. scores. This method is optional, you can find your own way to solve the problem too.

The `finalScore` method returns the sum of the scores given by the judges *by eliminating the two highest and the two lowest scores.*

The `getTotalScore` method is the sum of carried forward score and the final score.

The `prinfInfo` method displays the information of one country, i.e. a lady representing her country. You can see the printing format later in the following runtime captured screen shots.

Let us now explore the main class which drives the whole assignment:



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

- Two String arrays. One array `Countries` stores the name of countries and one array called `Titles` stores the titles of the three events *(Interview event, swimsuit competition event and evening gown competition event)*
- A method `getScore` returns an array of judges' scores via the formal parameter.
- A method `getAge` generates and returns the age of a participant, reasonable integer.
- To construct a list of `Country` objects. You can have an additional method to do this task or just do it in main.
- A method displays the game info (`displayGameInfo` method)
- A method displays the result (`displayResult` method using the print info method defined in the `MissWorld` class)
- A method displays the ranking (`displaySortedList` method)
- There is a `getCountry` method, I use this method to get the name of the country that has "certain" result. This is an optional method; you can find your own way to solve your problem.
- You can use an array to store the updated carried forward scores for each country (`updateCFArray` method), which is an optional method if you have some better ways to process the carried forward scores.

Convenient to your design, feel free to amend the suggested methods. Additional / deleting of the proposed methods are allowed.

Let us look at the runtime analysis:

```
Starting position for event: Interview

Country              Name       Age        c/f

China                Name 1     11         0.00
Thailand             Name 2     18         0.00
British Columbia     Name 3     19         0.00
South Korea          Name 4     14         0.00
Japan                Name 5     25         0.00
USA                  Name 6     22         0.00
Australia            Name 7     24         0.00
Venezuela            Name 8     20         0.00
Russia               Name 9     20         0.00
Brazil               Name 10    19         0.00
```

😊 age 11 is not an adult

```
Countries            J 1   J 2   J 3   J 4   J 5   J 6   J 7   J 8   J 9  J 10      c/f  Current    Total

China               9.41  9.09  8.16  3.12  5.82  7.55  5.88  6.47  3.99  6.72     0.00    40.60    40.60
Thailand            1.28  9.82  9.70  1.71  1.91  7.35  1.34  8.56  3.84  1.10     0.00    24.71    24.71
British Columbia    9.79  6.19  9.32  6.51  7.68  1.90  8.75  2.86  8.23  7.43     0.00    44.79    44.79
South Korea         4.88  6.58  6.82  4.06  3.91  2.24  9.91  8.27  1.01  5.62     0.00    31.87    31.87
Japan               8.24  8.86  3.34  9.24  7.20  3.81  9.67  4.26  2.76  4.99     0.00    37.36    37.36
USA                 2.04  3.52  6.59  3.62  0.26  9.31  8.11  4.14  1.99  4.96     0.00    24.87    24.87
Australia           2.51  1.80  9.85  8.40  7.18  3.16  8.75  0.41  9.97  8.35     0.00    38.35    38.35
Venezuela           2.34  8.98  0.23  8.77  3.32  3.19  8.52  9.46  5.04  0.41     0.00    31.18    31.18
Russia              0.61  6.49  2.58  6.80  6.92  9.06  7.17  9.43  1.61  5.05     0.00    35.01    35.01
Brazil              4.91  0.35  6.14  9.30  4.75  1.67  0.73  1.94  9.52  2.23     0.00    21.64    21.64

The result after the event: Interview

1   British Columbia    44.79
2   China               40.60
3   Australia           38.35
4   Japan               37.36
5   Russia              35.01
6   South Korea         31.87
7   Venezuela           31.18
8   USA                 24.87
9   Thailand            24.71
10  Brazil              21.64
--------------------------------------------------------------------------------
```

The first event is an interview event. Firstly, display the country information: the name of country, the name of the contestant, her age, and the carried over scores. Initially the carried forward score for each contestant is 0.00.

Next, a summary table to display the information for each country: scores given by judges, the carried forward scores, the total scores for current round and the final scores.

At the end of this event, you need to sort the total scores and display the ranking results.

Let us now look at the second event: the Swimsuit Competition.

```
Starting position for event: Swimsuit Competition

Country             Name       Age        c/f

China               Name 1     11         40.60
Thailand            Name 2     18         24.71
British Columbia    Name 3     19         44.79
South Korea         Name 4     14         31.87
Japan               Name 5     25         37.36
USA                 Name 6     22         24.87
Australia           Name 7     24         38.35
Venezuela           Name 8     20         31.18
Russia              Name 9     20         35.01
Brazil              Name 10    19         21.64
```

```
Countries            J 1   J 2   J 3   J 4   J 5   J 6   J 7   J 8   J 9  J 10     c/f  Current    Total

China               7.20  4.32  6.38  4.61  5.10  4.60  5.85  4.46  2.16  9.90   40.60    31.00    71.60
Thailand            8.50  1.47  8.31  9.63  5.74  3.34  6.01  9.42  0.50  5.67   24.71    37.57    62.28
British Columbia    4.42  6.67  5.62  7.71  4.82  8.75  2.23  8.14  3.34  3.33   44.79    32.58    77.37
South Korea         4.50  5.55  0.64  0.36  5.49  8.21  5.42  5.70  4.05  6.25   31.87    30.71    62.58
Japan               2.72  4.40  4.88  8.42  1.44  2.08  6.33  4.06  3.50  2.06   37.36    21.64    59.00
USA                 8.52  9.80  3.67  1.09  5.73  8.34  1.87  9.78  8.31  2.15   24.87    36.72    61.59
Australia           5.52  2.14  1.51  7.99  1.28  2.86  0.93  1.74  8.17  9.25   38.35    21.76    60.11
Venezuela           9.53  5.62  9.03  8.84  2.40  4.09  1.72  1.17  7.69  2.91   31.18    31.55    62.73
Russia              5.46  0.28  6.47  3.08  6.44  5.92  5.41  4.72  0.33  5.39   35.01    29.98    64.99
Brazil              4.43  7.14  0.50  0.62  6.89  6.46  5.03  5.96  7.85  5.87   21.64    34.64    56.28

The result after the event: Swimsuit Competition

1   British Columbia    77.37
2   China               71.60
3   Russia              64.99
4   Venezuela           62.73
5   South Korea         62.58
6   Thailand            62.28
7   USA                 61.59
8   Australia           60.11
9   Japan               59.00
10  Brazil              56.28
```

You do some similar tasks to the interview event. You can see that carried forward scores derived from the previous are updated.

Final event, the Evening Gown Competition:

```
Starting position for event: Evening Gown Competition

Country             Name       Age        c/f

China               Name 1     11         71.60
Thailand            Name 2     18         62.28
British Columbia    Name 3     19         77.37
South Korea         Name 4     14         62.58
Japan               Name 5     25         59.00
USA                 Name 6     22         61.59
Australia           Name 7     24         60.11
Venezuela           Name 8     20         62.73
Russia              Name 9     20         64.99
Brazil              Name 10    19         56.28
```

```
Countries             J 1   J 2   J 3   J 4   J 5   J 6   J 7   J 8   J 9  J 10      c/f  Current    Total

China                0.76  1.70  6.48  9.09  3.10  0.22  4.72  1.66  6.11  3.43    71.60    20.72    92.32
Thailand             0.68  0.40  6.44  2.93  2.47  1.73  1.76  2.85  5.35  7.04    62.28    17.09    79.37
British Columbia     3.95  8.45  7.47  2.18  0.21  8.95  0.58  6.71  1.81  7.06    77.37    29.18   106.55
South Korea          5.39  0.55  1.13  0.34  1.65  8.12  0.16  0.17  9.95  3.24    62.58    12.30    74.88
Japan                9.81  8.10  7.78  0.14  7.46  6.85  7.63  9.55  4.69  0.15    59.00    42.51   101.51
USA                  3.87  3.69  4.23  0.26  8.79  1.55  9.37  5.81  7.08  7.85    61.59    32.53    94.12
Australia            4.54  1.37  1.64  8.53  5.69  9.83  3.42  8.70  8.74  7.54    60.11    38.42    98.53
Venezuela            8.69  4.37  3.28  9.67  6.07  0.38  0.08  2.49  0.06  1.39    62.73    17.98    80.71
Russia               1.29  3.26  9.91  5.84  1.46  4.07  9.24  0.17  1.47  2.89    64.99    18.99    83.98
Brazil               2.57  1.87  9.16  2.41  5.72  3.89  4.41  1.73  7.78  3.81    56.28    22.81    79.09

The result after the event: Evening Gown Competition

1   British Columbia    106.55
2   Japan               101.51
3   Australia           98.53
4   USA                 94.12
5   China               92.32
6   Russia              83.98
7   Venezuela           80.71
8   Thailand            79.37
9   Brazil              79.09
10  South Korea         74.88
```

Note that convenient to your design, feel free to add additional methods or amend some of the proposed methods.

IMPORTANT

The name of your program must be exactly **YourName_No_A3.java (YourName = your name, No = your class list number)** 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.** No input is required for this assignment.

No re-submission will be allowed after grading.

In the above file, remember to put down your name and 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**