

Lab 07 – Methods and Top-down Design

Objectives

- Top-down design
- Procedural abstraction using methods
- Design algorithms and write Java program with respect to maintenance and team work

Preparation

Chapter 6

Details

As a programmer there are times that you must complete or maintain the program that already exists. Or you are working as a member of a team and some part of program is already done with others. This exercise provides you an incomplete program, and you are asked to complete it according to the description. You may get error(s) when you compile the first draft of the program.

Part A [40 marks] : This is to implement the `WarGame` that discussed in the lecture. Take the `WarGame.java` from D2L and complete the code. Do NOT change `main`, `printRoundInfo` or `printRoundResult` methods. You can add more methods if it is needed. Provide internal and external documentation including the design diagram.

- In this game, in each round the program asks a number from user that stand for a card. It also randomly selects a card for computer. Then it declares the cards that user and computer have chosen followed by the winner. The card with higher rank is the winner and gets one score. The suit of card doesn't matter for winning. If they are tie, the user's total score must be doubled. The program must be executed 10 rounds and then declares the total score of the user.
- Ace, Jack, Queen and King must be considered as 1, 11, 12 and 13 respectively.
- The following is part of output for one run. The highlighted data is user inputs.

```
==> Enter your card : 12
R1: Computer card is 10 of Diamonds; User card is Queen of Hearts
User wins – user score is 1
==> Enter your card : 46
R2: Computer card is Ace of Diamonds; User card is 7 of Clubs
User wins – user score is 2
==> Enter your card : 36
R3: Computer card is 10 of Hearts; User card is 10 of Spades
It's tie – user score is 4
==> Enter your card : 16
```

R4: Computer card is 9 of Diamonds; User card is 3 of Diamonds
Computer wins – user score is 4
...
==> Enter your card : 18
R10: Computer card is 4 of Spades; User card is 5 of Diamonds
==> User wins – user score is 19
End of Game!

Part B [10 marks]:

- 1- In the main method to call `genInput` method use the name of class and dot operator, i.e: replace `comp = genInput();` (line8) with `comp = WarGame.genInput();` and compile and run the program. What happens?
- 2- Now remove `static` modifier in the `getInput` method's header and compile the program. What happens? Justify the result.

Submission

Make a folder containing your source code (WarGame.java file : Your answer to Part A) and external documentation, zip the folder and submit the zip file to D2L. Check Lab Guide (section 3) to find out more details about your submission and grading.