

CST8110 – Introduction to Programming

Assignment #3 – Loops

DUE: Friday November 15th at 6pm SHARP – see submission instructions below. Late submissions receive a grade of 0.

Problem Description:

Using the steps for Problem Solving – generate for the following problem:

- a) test plan AND
 - b) write and test the program code in Java.
- This problem will simulate a game of Solitaire Blackjack (an invented game). You are welcome to customize the game to your own rules – just be sure to document them. **However, you must meet the basic requirements which follows.**
 - The user will start with a pot of \$100.
 - In each play of the game, the user will
 - o Enter a valid bet amount (less than or equal to the current pot, not negative, **0 means quit the game**).
 - o Remove their bet amount from the pot
 - o Draw two cards (simulate this using the Random class in Java) and add their values to a total
 - o Ask the user if they wish to continue to draw cards to add to total – draws should continue until user says they don't wish to continue drawing
 - o Then, the pot should be adjusted in the following way:
 - If their total is > 21 – they win double their – they lose their bet
 - If their total is 21, they win triple their bet amount (to be added to their pot)
 - If their total is 20, they win double their bet amount (to be added to their pot)
 - If their total is <= 19, they win their bet amount (to be added to their pot)
 - **The game will end with a bet of 0 OR when the pot reaches 0.**

Sample Output : (*blue indicates user entered information*)

Welcome to Solitaire Blackjack..bet an amount - if you draw 19 or under, you keep your bet, if you
draw 20 you win double your bet, if you draw 21 you win triple your bet, otherwise you lose your bet

A bet of 0 ends the game
Your current pot is 100
Enter your bet amount: 10
Your first card is : 6
Your second card is : 10
Your total is 16
Enter 0 to draw more, any other number to quit: 1
You WIN....your bet

Your current pot is 100
Enter your bet amount: 20
Your first card is : 3
Your second card is : Queen
Your total is 15
Enter 0 to draw more, any other number to quit: 0

Your next card is : 6
Your total is 21
You WIN....triple your bet

Your current pot is 140
Enter your bet amount: 30
Your first card is : 8
Your second card is : 7
Your total is 15
Enter 0 to draw more, any other number to quit: 1
You WIN....your bet

Your current pot is 140
Enter your bet amount: 30
Your first card is : 2
Your second card is : 2
Your total is 4
Enter 0 to draw more, any other number to quit: 0

Your next card is : 6
Your total is 10
Enter 0 to draw more, any other number to quit: 0

Your next card is : 6
Your total is 16
Enter 0 to draw more, any other number to quit: 0

Your next card is : 6
Your total is 22
You LOSE...

Your current pot is 110
Enter your bet amount: 0
You end the game with pot of 110

Submission Requirements:

- You must create a .zip file that contains ONLY the following:
 - Your program code - .java files - (with your name, section, lab teacher listed in comments in the header of each class)
 - A document created with either Notepad, Wordpad or Word named Assign3.docx or Assign3.txt with your test plan - note this should contain your name, section and lab teacher listed at the top.
- The .zip file must have the following as it's name
 - Your last name, your first name, the word assign and the assign number ...
Example CraneLindaAssign3.zip
- Submit the .zip file through the Assignment feature which has been enabled in the CST8110 Blackboard course. This should be directly under the Assignment description.
- Marks will be given for correct submission (ie marks will be deducted for incorrect submission!)

Notes on Using the Random class in Java

- See also pages 209-215 of Java, How to Program Textbook
- The Random class is found in library `java.util`.
 - ie ... we need to `import java.util.Random` into a java program to be able to use it
- You need to declare an object of the class first:
 - ie ... declare once in your program, at the beginning:
`Random randomNumbers = new Random ();`
- Then, you can call a method called `nextInt` on your object of Random class with an integer parameter which will return a random number between 0 and the integer parameter - 1. In other words, the `nextInt` method returns a random number % the parameter you sent to it.
 - In our case, we want to generate a random number between 1 and 13, so we can execute `nextInt(13)`...which returns a random number between 0 and 12 and then add 1 to get a number between 1 and 13.
 - ie ... any time you want to generate a random number and store it into a variable that you have already declared (in this example, `cardValue`), execute :
`cardValue = randomNumbers.nextInt (13) + 1;`