Student Name: \_\_\_\_\_\_Eyad Alsahori\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **ASSIGNMENT GOALS:**   1. **Get more experienced with the Java Language and Eclipse operation.** 2. **Leverage a Custom “utility” Class that’s already been developed for you.** 3. **Complete the implementation of a partially completed, stubbed out, custom Class to meet the specifications of a stated requirement.** |

(20 Points)

1. **Read Textbook Chapter 5 – pp 269-304** – and complete the following exercises (starting at the top P308):

**Short answers – (12 pts).**

**T/F Questions starting at the top of P308**

15) True / False ? true

16) True / False ? true

19) True / False ? false

20) True / False ? true

**Short Answer Questions starting at the bottom of P310**

1)

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| The divide and conquer approach to problem solving, is when you basically divide the problem into smaller or a set of subproblems, which then helps you solve these smaller parts of the problem more easily. |

5)

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| Pass by value is when you make a copy in memory of the actual parameter's value that is passed in and then the copied object is passed |

(80 Points)

**NOTE** start with the source code provided: **edu.cuny.csi.csc330.lab3.** **LottoQuickPicker**

1. **Programming assignment (80 points):** 
   1. You will be designing / implementing the completion of a Program that simulates the ‘QuickPick’ function at a local convenience-store when selling Lottery Game Tickets such as

Lotto, MegaMillons, Daily Number, PowerBall, etc.

You will need the “services” of the already implemented Class called the “Randomizer” - specifically, the generateInt() method which has the following “signature”:

/\*\* Returns a random integer value between the values passed in as arguments – high and low – inclusive of. So invoking generateInt(100, 200) might return 100, or 200 or any value between …

\*/

**int generateInt(int low, int high){ }**

* 1. Review the code of the “stubbed out”   
     edu.cuny.csi.csc330.lab3.LottoQuickPicker

Finish the implementation of this Class given the following requirements reviewed in class:

* + 1. **Needs to generate 1 or more quick pick game (one by default – overridden by an optional command line argument).**
    2. **For each game:**
       1. Generate 6 **unique** numbers between **1 and 59**.
       2. The Class is responsible for displaying the game ticket as described below (see actual example below as well).
          1. The **unique** numbers for each game must be sorted in ascending order on the same horizontal line.
          2. The Game Ticket should display a game specific heading including a date/time.
          3. Each game will be numbered/indexed – 1,2,3, … N
          4. Game numbers will be evenly spaced /formatted. And single digit numbers will be padded with a leading 0.
          5. The Game Ticket should display both a header and trailer of your own choosing (see general format and sample displayed ticket below).

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| ***LOTTO***  ***Jan 5, 2022 10:11am***  *( 1) 15 18 25 32 37 42*  *( 2) 12 28 44 46 55 57*  *……………*  *(N) 02 09 19 20 21 29*  ***<store name>*** |

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| **Actual NYS Ticket** | **Proposed Program Output** |
| New York Ticket Lotto | ---------------------------------  ------------ LOTTO ------------  Wed Jan 5 10:11:17 EDT 2022  ( 1) 15 18 25 32 37 42  ( 2) 12 28 44 46 55 57  ( 3) 16 18 24 27 28 54  ( 4) 08 25 29 38 40 44  ( 5) 05 14 18 29 53 58  ***<store name>*** |

**EXTRA CREDIT FEATURE +10 points**

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| ---------------------------------  ------------ LOTTO ------------  Sun, Aug 22, 2021 9:39:26 AM  ( 1) 15 18 25 32 37 42  ( 2) 12 28 44 46 55 57  ( 3) 16 18 24 27 28 54  ( 4) 08 25 29 38 40 44  ( 5) 05 14 18 29 53 58  ( 6) 31 44 46 50 51 54  ( 7) 08 09 11 14 29 47  **Odds of Winning: 1 in *45,057,474* <<<<<< EXTRA CREDIT INFO**  ----- (c) S.I. Corner Deli -----  --------------------------------- |

* How would you calculate the odds of customer winning a single purchased Lotto Game? Well, what are the odds of picking 6 randomly selected numbers out of a pool of 59 numbers? Research the mathematical solution, and code it in the calculateOdds() method - and display the value returned by this method as shown above.
* NOTE:
  + Your solution should work for any game specification – not just 6 of 59.
  + To get full [10 points] credit, describe your solution in comment block above the calculateOdds() method.

**PASTE YOUR SAMPLE OUTPUT HERE**

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