

AP Computer Science Java

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Program 14A

PROGRAM 14A Rock Paper Scissors Lizard Spock (30 points)

This program is going to practice methods, if statements, random numbers, and loops. Write a program to play the game Rock, Paper, Scissors, Lizard, Spock (RPSLS). The user will be playing against the computer. Ask the user for their choice, generate a random choice for the computer, determine who wins or if there is a tie, keep a running total of who wins each round, and display the results each time the user chooses to play the game. This program can be written using if, else if statements to determine the winner, and to convert from the user's choice to a number and to convert the computer's numeric choice to a corresponding string representing the computer's choice. You could use your own algorithm or the class could ask me to discuss an algorithm using the modulus operator. **You must use `Math.random()` to generate random numbers.**

- 1) Type comments at the beginning of the program to display your name and other information just like those used for program 2A. **Be sure to update the program name, program number, and program description.**
- 2) Import Scanner.
- 3) Declare the class name in the format LastNameFirstNameP14A. Don't forget that the filename needs to be the same when you save your program. This would be a good time to save your program if you haven't done so already, LastNameFirstNameP14A.java.
- 4) Declare the main method:
`public static void main(String [] args)`
- 5) Instantiate an object of the Scanner class in order to use input from the keyboard.
`Scanner reader = new Scanner(System.in);`
- 6) Declare all of the variables necessary for this program. **You will need a string variable for `menuChoice`.** Make sure that you use descriptive variable names to create readable, self-documenting code.
- 7) Type the following comment:
`//-----Display My Information-----`
Follow this comment with `println` statements to display your name and period output just like those used for program 2A. Do not repeat this information each time the program repeats.
- 8) The main method will need to use a **while loop (NOT a do...while loop like we used in Program 7)** to see if the user wants to repeat the program. **The program should continue repeating until the user enters a "Q" or a "q".** Do not repeat displaying your information every time the program repeats.

- 9) Type the following comment:
//-----Display My Information-----
Follow this comment with the method `Display_My_Info()` that uses print statements to display your name and period output. **Be sure to change the program name, and program number.**
- 10) **Use methods in this program (see step #11).** Start your method names with **public static** and then **void** or **int**, etc. The methods should be at the end of your program after the `}` that ends the **public static void main (String [] args)** method and before the final `}` that ends your **public class LastNameFirstNameP14A** class.
- 11) You will need a method for the menu (which gets the user's choice), a method to get the computer's choice (generate a random number for this), methods to convert between numbers and names (rock is 0, etc.) and vice versa, a method to determine the winner, a method to count how many times the player won, computer won, and ties, and a method to display the results.
- 12) Display the menu as pictured and ask the user to enter their choice. Upper and lower case values should work for the menu choice to quit.
- 13) After the user has selected their choice, **generate a random integer using `Math.random()`** to represent the computer's choice (see the PowerPoint from Chapter 4 if you forgot how to do this).
- 14) Determine who won or if there is a tie. Keep a running total of how many times the player wins versus the computer wins.
- 15) Display who chose what, who won (or if there was a tie), and how many times the "player" won and how many times the "computer" won.
- 16) Save your program as `LastNameFirstNameP14RPSLS.cpp`.

```
Rock Paper Scissors Lizard Spock Main Menu
1. Rock
2. Spock
3. Paper
4. Lizard
5. Scissors
Q. Quit the game
```

Use blank lines to separate each of the program sections listed in all of the steps above. When you are finished with your program, have tested it thoroughly to make sure that your calculations are correct, and are sure that you don't need to make any changes, then save your program in the "T" network mapping, in the Program 14 RPSLS folder.