# 44-542 Object Oriented Programming

# Lab01: Objects Lab Activity

**Objective:** Covers the usage of **String**, **Random**, and **Math** classes and its methods.

**NOTE:**

* For the **String** problems in this lab, use only **String** methods. You do not need to use arrays, **split** method, or any looping or selection constructs.
* Do not hard code any values and must follow the given naming conventions.
* Check the given sample output to know how the results need to be printed.

1. Create a New Project and name it as **Lastname\_Lab01Objects** where **Lastname** is your last name.
2. Create a new package in the project created and name it as **objects**.
3. Create a new Java Main Class in this package created and name it as **StringsAndNumbers.** @author annotation must contain your full name.
4. Use the same **StringsAndNumbers** class to answer all the below questions.

**Questions**

1. Inside the Main method do the following:
   1. Declare and initialize the below four variables as **String** data types:
      1. **string1** - **Welcome** with 3 leading spaces,
      2. **string2** - **to** with 2 trailing space and 3 leading space**,**
      3. **string3** – **Computer** with no leading and no trailing spaces**.**
      4. **string4** - **Science** with 1 leading and 5 trailing spaces.
      5. **string5** - **and** with 1 leading and 1 trailing spaces.
      6. **string6** - **Information** with 2 leading and 4 trailing spaces.
      7. **string7** - **Systems** with 3 trailing spaces.
   2. Concatenate all the above strings and store them in a variable named as **string8.**
   3. Print the length of the above concatenated string.
   4. Remove the leading and trailing spaces in **string4**, store the resultant String to a new variable named as **string9**. Print the length of the resultant string.
   5. Retrieve the “Science” word from **string8** using **substring** method only. Print the first index of letter “e”.
2. Given the String **“rnururrunngisnnurun”**, write a statement to print the index of the first occurrence of the word **“run”**. Extract the word **“run”** from above String, also extract the word “is”. Concatenate these both with the String **“fun”** to create the String **“runisfun”**. Print the result.
3. Methods in the **Math** class are all static methods. Static methods do not require an instance of the class to be invoked. Instead, you use the class name, followed by a dot, followed by the method. Use the **Math** class to complete these problems. Use various methods in **Math** Class, refer API for more information.
   1. Write statements for below:
      1. Declare two **int** variables, **myValue1** and **myValue2,** and initialize them with 4 and 6 respectively. Write a statement that computes **myValue1** raised to the power of **myValue2**. Print the result.
      2. Declare a **double** variable **myNumber** and initialize it with 26.30. Write a statement that returns the square root of **myNumber**. Print the ceiling and floor values.
      3. Declare two **double** variables, **myNumber1** and **myNumber2**, and initialize them with 30 and 75. Write statements to find the sine and tangent for each variable. Print the rounded values for each result obtained.
   2. Compute the result of) Print the ceiling value of the result.
4. The **Random** class can be used to generate pseudorandom numbers – they look like random numbers, and they act like random numbers, but they aren’t quite random. For help in completing the following problems, refer to **(Random class Java API)**
   1. Create an instance of the **Random** class using the number **10L** as the seed value (the **L** following the **10** indicates that the number is of type **long**, rather than **int**). Generate and print 7 pseudorandom integer values between 0 (inclusive) and 200 (exclusive).
   2. Run your program two or three times. Do you get the same result each time? Write your answer in a print statement.
   3. Now create an instance of the **Random** class using *no* seed value. Run your program two or three times again. Do you get the same result each time? Write your answer in a print statement.
   4. Compare your results from b) and c) and explain the difference. Write the Explanation for this within a print statement.

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| **Sample Output:**  The length of the concatenated string is:69  Length of the trimmed string is:7  Index of first e in science is:3  First occurrence of word run is:6  runisfun  4096.0  Square root of the number is:5.128352561983234  Ceil Value is:27.0  Floor Value is:26.0  -1  0  -6  0  2.0  First Random value:113  Second Random value:180  Third Random value:93  Fourth Random value:90  Fifth Random value:46  Sixth Random value:56  Seventh Random value:197  \*\*\*Answer 4(b) here\*\*\*  First Random value:121  Second Random value:43  Third Random value:76  Fourth Random value:125  Fifth Random value:69  Sixth Random value:173  Seventh Random value:192  \*\*\*Answer 4(c) here\*\*\*  \*\*\*Answer 4(d) here\*\*\* |

**Submit you solution by following the steps below:**

* Save your files in NetBeans.
* Zip your entire Project. (It should be called *Lastname*\_Lab01Objects.zip where Lastname is your last name.)
* Submit the Zip file to the Lab01Objects dropbox.
* Download the Zip file you have submitted.
* Look in the Zip file and verify that **StringsAndNumbers.java** is correct. If not resave your project in NetBeans and resubmit.