# Lab Four

Objectives:

To use methods in the Math class
To use the random() method
To work with the character data type
To work with Unicode and ASCII
To create code that uses the escape characters
To work with strings

**Assignment:**

You will create a new program called **LastNameFirstInitialLab4**. The program will ask a user to enter some data and then the program will perform some actions using this data. These actions will be described below. The actions will need to be done in order.

Your program will have the necessary import statement(s), and the comments for the integrity statement, lab number, and programmer name and course name in the correct places. As always, it must also print out the lab #, programmer's name, course name and section #, and the program information.

**Notes:**

- Your program must look like the sample using the same verbiage.
- I suggest that you look at the samples before you begin so you will know what this program will look like.

## Working with the Math and Random classes & the Escape Characters

Create the following variables with these initial values (Make sure to use the correct data type for the variables):

```
realNumber1 = 5.5;
realNumber2 = 2.37;
realNumber3 = 5.0;
realNumber4 = 1.14;
realNumber5 = 0.0;
integerNumber = 0;
```

1. Show the ceiling of **realNumber1** and the floor of **realNumber2**.
2. Show the square root of **realNumber3** and the cosine of **realNumber4**.
3. Assign **integerNumber** a random integer between 1 and 50 exclusive and assign **realNumber5** a random number between 2.5 and 8.7 exclusive. Display Number5 and realNumber6. [Exclusive means that the ending number will not be included].
   **Hint:** The easiest way to calculate a range is to use the formula of
   Math.random() * (b - a) + a // where a is the lower # and b is the higher #.
   This can also be written as:
   a + Math.random() * (b - a)
4. Using the min() method, show the minimum number of **realNumber1** and **realNumber2**
5. Using the max() method, show the maximum number of **realNumber3** and **realNumber4**.

## Working with the char and string methods

Create the following variables with these initial values:

| Variable name | Data type | Initial value |
|---|---|---|
| **firstName** | **String** | **""** |
| **middleInitial** | **char** | **0** |
| **symbol** | **char** | **0** |
| **lastName** | **String** | **""** |
| **fullName** | **String** | **""** |
| **herName** | **String** | **Pamela** |
| **hisName** | **String** | **Bill** |
| **indexWhere** | **int** | **0** |
| **length** | **int** | **0** |

1. Ask a user to enter his or her first name into firstName.
2. Ask a user to enter his or her middle initial into middleInitial.
3. Ask a user to enter his or her last name into lastName.
4. Show the firstName in upper case and then in lower case.
5. Use concatenation to put together the first name, middle initial, and last names into the variable called fullName. Make sure to add the needed spaces and the period that will follow the initial in that assignment statement. Print out the full name.
6. Use the length() method to figure out the length of fullName and assign it to length. Print the length.
7. Use an if/else statement along with the compareTo() method to check the names firstName and herName and show them in alphabetical order. **Hint:** Program Listing 4.2: OrderTwoCities is a good guide).
8. Using herName, use the substring() method to write a line of code that says, Hi, Pam!
9. Use the indexOf() method to assign the index of the 1st occurrence of the character l in hisName to indexWhere. (That is a small letter L). Print out indexWhere.
10. Assign the variable called symbol the Unicode for the euro sign **€** and print it.

**Notes:**

- Do not worry about formatting or how many decimal places the numbers use (we are *so* close to knowing how to do this).
- Do not go above the objectives of the assignment. I will not expect to see any loops or special formatting for example.
- Make sure your program uses proper indentation and wise use of whitespace. You can select Source from the menu and then select Format. This will automatically help with indentation and some whitespace issues. However, check it yourself afterward to be sure it is as readable as possible.
- The grading rubric is at the end of the assignment.

## To Submit this lab:

In Canvas, upload the Java file to the assignment. This will be the file called **LastNameFirstInitialLab4.java**.

## SAMPLE RUN SCREENS

**First time running the program: Susan B Anthony**

Lab Four
Christine Kikuchi
CSC 130, Sec #

This program will work with the Math and Random classes.
The program will use some of the Escape Characters
It will also demonstrate working with the char and String data types.

Working with the Math and Random classes & the Escape Characters

The ceiling is 6.0 The floor is 2.0
The square root is 2.23606797749979 The cosine is 0.4175945039583582
integerNumber's value is 1's value is 1 realNumber5's value is 2.5226909362097643
The minimum number of 5.5 and 2.37 is 2.37
The maximum number of 5.0 and 1.14 is 5.0

Working with the char and string methods

Enter your first name: Susan
Enter your middle initial: B
Enter your last name: Anthony

The first name in upper case is SUSAN
The first name in lower case is susan

Your full name is Susan B. Anthony

The full name, including spaces is 16 characters long

The names in alphabetical order are Pamela and then Susan

Hi, Pam!

The first letter l in Bill's name is at the index of 2

The symbol for the Euro sign is €

The special character for the single quote mark was used for the possessive.

Tabs were used to line up the ceiling/floor, square root/cosine, & the two real numbers.

A special character for the single quote mark was *not* used for this line. Instead, the variable for Bill was used and the following string is "'s name is at the index of "

**Second time running the program: Madeline J Stepanchikov**

Lab Four
Christine Kikuchi
CSC 130, Sec #

This program will work with the Math and Random classes.
The program will use some of the Escape Characters
It will also demonstrate working with the char and String data types.

Working with the Math and Random classes & the Escape Characters

The ceiling is 6.0 The floor is 2.0
The square root is 2.23606797749979 The cosine is 0.4175945039583582
integerNumber's value is 38 realNumber5's value is 3.7280396390406585
The minimum number of 5.5 and 2.37 is 2.37
The maximum number of 5.0 and 1.14 is 5.0

Working with the char and string methods

Enter your first name: Madeline
Enter your middle initial: J
Enter your last name: Stepanchikov

The first name in upper case is MADELINE
The first name in lower case is madeline

Your full name is Madeline J. Stepanchikov

The full name, including spaces is 24 characters long

The names in alphabetical order are Madeline and then Pamela

Hi, Pam!

The first letter l in Bill's name is at the index of 2

The symbol for the Euro sign is €