# 44-542 Object Oriented Programming

# Lab: Objects

For the **String** problems on this worksheet, use only **String** methods. You don’t need arrays, the **split** method, or any looping or selection constructs.

1. Given the String **“onlienonlieeonlinnonlineonliionlline”**, write a program to print the index of the first (and only) occurrence of the word **“online”**. For practice with using the **substring** method, after finding the beginning index of the word **“online”**, extract and return the whole word. Concatenate this with the String **“Northwest”** to create the String **“Northwest online”**. Print the result to the screen.

PROGRAM:

Filename\_01 : Program01.java

package Program1;

/\*\*

\*

\* @author s524965

\*/

public class Program01 {

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

String word="onlienonlieeonlinnonlineonliionlline";

int index=word.indexOf("online");

System.out.println("Index of First Occurance :"+index);

String newWord=word.substring(index,24);

System.out.println("Northwest "+newWord);

}

}

1. 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. For example, **Math.abs(-10)** returns the absolute value of -10. Use the **Math** class to complete these problems. Choose values to assign to the variables below. Test your solution by writing a Java program that uses the statements you have written. For help in completing the following problems, refer to <http://docs.oracle.com/javase/8/docs/api/java/lang/Math.html>.
   1. Suppose we have a **double** variable **myDoubleValue**. Use the **Math** class to write a statement that returns the square root of **myDoubleValue**.
   2. Given two **double** variables, **myDoubleValue1** and **myDoubleValue2**, use the **Math** class to write statements to find the sine and tangent of the two numbers.
   3. Suppose we have two **int** variables named **myIntNumber1** and **myIntNumber2**. Use the **Math** class to write statements that return **myIntNumber1** raised to a power **myIntNumber2**.

Filename: Program02.java

package Program2;

/\*\*

\*

\* @author s524965

\*/

public class Program02 {

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

double myDoubleValue=123.45;

double myDoubleValue1=100.55;

double myDoubleValue2=111.77;

int myIntNumber1 =5;

int myIntNumber2= 2;

System.out.println("Square Root:"+ Math.sqrt(myDoubleValue));

System.out.println("Sin Value of myDoubleValue1:"+ Math.sin(myDoubleValue1));

System.out.println("Sin Value of myDoubleValue2:"+ Math.sin(myDoubleValue2));

System.out.println("Tangent Value of myDoubleValue1:"+ Math.tan(myDoubleValue1));

System.out.println("Tangent Value of myDoubleValue2:"+ Math.tan(myDoubleValue2));

System.out.println(myIntNumber1+" to the power of "+myIntNumber2+" is:"+ Math.pow(myIntNumber1, myIntNumber2));

}

1. 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 <http://docs.oracle.com/javase/8/docs/api/java/util/Random.html>.
   1. Create an instance of the **Random** class using the number **26L** as the seed value (the **L** following the **26** indicates that the number is of type **long**, rather than **int**) . Generate and print 3 pseudorandom integer values between 0 (inclusive) and 200 (exclusive).

Filename:Program03.java

package Program3;

import java.util.Random;

/\*\*

\*

\* @author s524965

\*/

public class Program03 {

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

long seedValue=26L;

Random rnd=new Random(seedValue);

Random rnd1=new Random();

/\* For loop for generating three Random numbers with SEED VALUE \*/

for(int i=1;i<=3;i++)

{

int rnd2=rnd.nextInt(200);

System.out.println("Random Number"+i+"(with SEED): "+rnd2);

}

/\* For loop for generating three Random numbers without SEED VALUE \*/

for(int i=1;i<=3;i++)

{

int rnd3=rnd1.nextInt(200);

System.out.println("Random Number"+i+"(without SEED): "+rnd3);

}

}

}

* 1. Run your program two or three times. Do you get the same result each time?

Answer: Yes. I get the same result every time.

* 1. 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?

Filename:Program03.java

package Program3;

import java.util.Random;

/\*\*

\*

\* @author s524965

\*/

public class Program03 {

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

long seedValue=26L;

Random rnd=new Random(seedValue);

Random rnd1=new Random();

/\* For loop for generating three Random numbers with SEED VALUE \*/

for(int i=1;i<=3;i++)

{

int rnd2=rnd.nextInt(200);

System.out.println("Random Number"+i+"(with SEED): "+rnd2);

}

/\* For loop for generating three Random numbers without SEED VALUE \*/

for(int i=1;i<=3;i++)

{

int rnd3=rnd1.nextInt(200);

System.out.println("Random Number"+i+"(without SEED): "+rnd3);

}

}

* 1. Describe and compare your results from b) and c) and explain the difference.

There is a difference between Program B and Program C results. Even though both the program generates Random Numbers within the range of 0 to 200. Pseudorandom Numbers are generated depending upon the given input seed value, i.e, for the input seed value the pseudorandom numbers are 104,164,139 every time and for the Program C random numbers as there is no Seed value specified, everytime the program gets compiled new values are generated in between the range.

**Extra Problems!!!** Want some more problems to work on? Try the optional exercises shown below.

1. Given the String **“ Northwest Missouri State University ”**, write a program using only **String** methods that creates the String **“NMSU”**. Note that each letter of the acronym is capitalized. Also note that there are no leading or trailing spaces in the printed string. Your code should work for any string consisting of four words, with any number of leading and trailing spaces. You may assume that there is always a single space *between* any two words.

Filename: Program04.java

package Program4;

import java.util.Scanner;

/\*\*

\*

\* @author s524965

\*/

public class Program04 {

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

String s1=" Northwest Missouri State University ";

String s2= s1.trim();

System.out.println("Given String:"+s2);

int i=s2.indexOf(" ");

int j=s2.indexOf(" ",i+1);

int k=s2.indexOf(" ",j+1);

int l=s2.lastIndexOf(" ");

System.out.println(s2.substring(0,1).concat(s2.substring(i+1,i+2)).concat(s2.substring(j+1,j+2)).concat(s2.substring(k+1,k+2)));

}

}

1. Given a String, such as **“With great power often comes great confusion”** write a program that will extract the third word of the string and prints it in all capital letters. Your program should work for any sentence that contains at least four words.

Filename: Program05.java

package Program5;

import java.util.Scanner;

/\*\*

\*

\* @author s524965

\*/

public class Program05 {

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

// TODO code application logic here

// String s="With great power often comes great confusion";

String s;

System.out.println("Enter a string:");

Scanner scan=new Scanner(System.in);

s=scan.nextLine();

int l=s.length();

int count=0;

for(int i=0;i<l;i++)

{

if(s.substring(i,i+1).equals(" "))

{

count++;

}

if(count==2)

{

StringBuilder builder = new StringBuilder();

String words = null;

for(int j=i;j<l-1;j++)

{

words= s.substring(j+1,j+2);

builder.append(words);

if(s.substring(j+1,j+2).equals(" "))

break;

}

System.out.println("Third Word:"+builder.toString());

System.out.println("Third Word in UPPER Case:"+builder.toString().toUpperCase());

break;

}

}

}

}