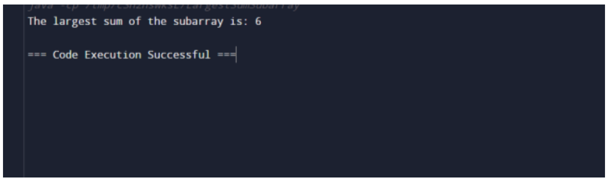
13/7/24 **ASSIGNMENT-6**

1.Write a program to given an integer array nums, find the subarray with the largest sum, and return its sum.

Input nums = [-2, 1,-3, 4,-1, 2, 1,-5, 4]
Output: 6
Explanation: The subarray [4,-1, 2, 1] has the largest sum 6.

```
public class LargestSumSubarray {
    public static void main(String[] args) {
        int[] nums = {-2, 1, -3, 4, -1, 2, 1, -5, 4};
        System.out.println("The largest sum of the subarray is: "+maxSubArray(nums));
    }
public static int maxSubArray(int[] nums) {
        int maxfir=nums[0];
        int maxlast=nums[0];
for (int i=1;i<nums.length;i++) {
            maxlast=Math.max(nums[i],maxlast+nums[i]);
            maxfir=Math.max(maxfir,maxlast);
        }
return maxfir;
    }
} max subarray
```



```
java -cp /tmp/t3h2hswksL/LargestSumSubarray
The largest sum of the subarray is: 6

=== Code Execution Successful ===
```

2.Write a program to print the multiplication table of number m up to n.

Sample Input:

M = 4
N = 5

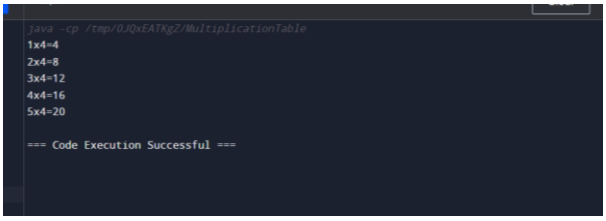
Sample Output:

1x4=4
2x4=8
3x4=12
4x4=16
5x4=20

Test cases:

M = 6, N = -3
M = -3, N = 5
M = 4, N = 0
M = 0, N = 0
M = -5, N = -5

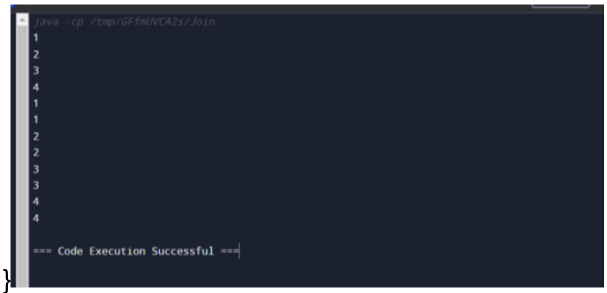
```
public class MultiplicationTable {
    public static void main(String[] args) {
        int m = 4;
        int n = 5;

        for (int i = 1; i <= n; i++) {
            System.out.println(i + "x" + m + "=" + (i * m));
        }
    }
}
```



```
java -cp /tmp/0JQxEATKgZ/MultiplicationTable
1x4=4
2x4=8
3x4=12
4x4=16
5x4=20

=== Code Execution Successful ===
```

3.Write Java programs to implement multiple threads and apply join method for thread and thread has to be started after 500ms using sleep ().

```
public class Join extends Thread
{
   public void run()
   {
      for(int i=1; i<=4; i++)
      {
         try
         {
            Thread.sleep(500);
         }catch(Exception e){System.out.println(e);}
         System.out.println(i);
      }
   }
   public static void main(String args[])
   {
      Join t1 = new Join();
      Join t2 = new Join();
      Join t3 = new Join();
      t1.start();
      try
      {
         t1.join();
      }
catch(Exception e)
{
System.out.println(e);
}
      t2.start();
      t3.start();
   }
```



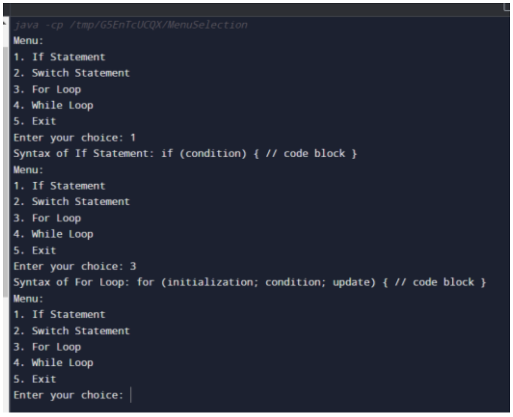
```
java -cp /tmp/GFfmUVCA2s/Join
1
2
3
4
1
1
2
2
3
3
4
4

=== Code Execution Successful ===
```

}

4.Generate a Java code that implements java selection and iteration statements. Use do while loop to process a menu selection. When a menu is selected, it should display the syntax of the selected statements.

```
import java.util.Scanner;

public class MenuSelection {
  public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    int choice;

    do {
      System.out.println("Menu:");
      System.out.println("1. If Statement");
      System.out.println("2. Switch Statement");
      System.out.println("3. For Loop");
      System.out.println("4. While Loop");
      System.out.println("5. Exit");
      System.out.print("Enter your choice: ");
      choice = scanner.nextInt();

      switch (choice) {
        case 1:
          System.out.println("Syntax of If Statement: if (condition) { // code block }");
          break;
        case 2:
          System.out.println("Syntax of Switch Statement: switch (expression) { case value: // code block break; default: // code block }");
          break;
        case 3:
          System.out.println("Syntax of For Loop: for (initialization; condition; update) { // code block }");
          break;
        case 4:
          System.out.println("Syntax of While Loop: while (condition) { // code block }");
          break;
        case 5:
          System.out.println("Exiting...");
          break;
        default:
          System.out.println("Invalid choice. Please try again.");
      }
    } while (choice != 5);
```

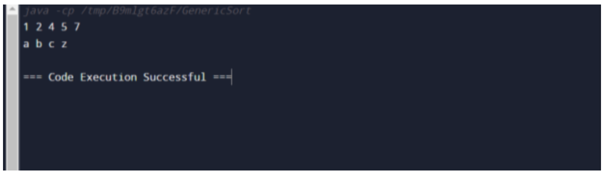
```
        scanner.close();
    }
}
```



```
java -cp /tmp/G5EnTcUCQX/MenuSelection
Menu:
1. If Statement
2. Switch Statement
3. For Loop
4. While Loop
5. Exit
Enter your choice: 1
Syntax of If Statement: if (condition) { // code block }
Menu:
1. If Statement
2. Switch Statement
3. For Loop
4. While Loop
5. Exit
Enter your choice: 3
Syntax of For Loop: for (initialization; condition; update) { // code block }
Menu:
1. If Statement
2. Switch Statement
3. For Loop
4. While Loop
5. Exit
Enter your choice: 
```

5.Create a simple generics class with type parameters for sorting values of different types.

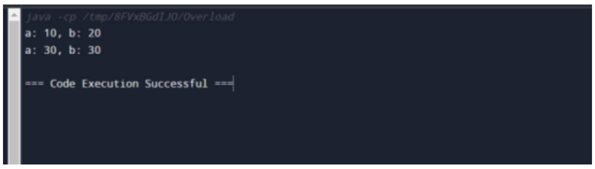
```
import java.util.Arrays;

public class GenericSort<T extends Comparable<T>> {
    private T[] array;

    public GenericSort(T[] array) {
        this.array = array;
    }

    public void sort() {
        Arrays.sort(array);
    }

    public void printArray() {
        for (T element : array) {
            System.out.print(element + " ");
        }
        System.out.println();
    }

    public static void main(String[] args) {
        Integer[] intArray = {4, 2, 7, 1, 5};
        GenericSort<Integer> intSort = new GenericSort<>(intArray);
        intSort.sort();
        intSort.printArray();

        String[] strArray = {"z", "a", "c", "b"};
        GenericSort<String> strSort = new GenericSort<>(strArray);
        strSort.sort();
        strSort.printArray();
    }
}
```



```
java -cp /tmp/B9mlgt6azF/GenericSort
1 2 4 5 7
a b c z

=== Code Execution Successful ===
```

6.Create a class name ‘overload’. Write a program to assign the values for two values by different number of arguments using a single function

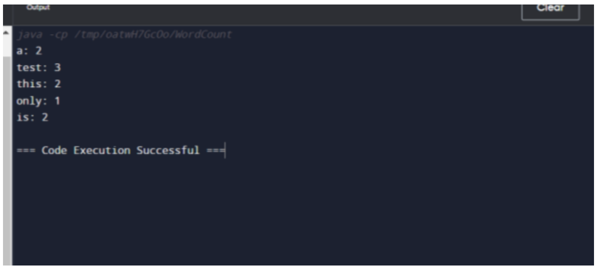
```
public class Overload {
    private int a;
    private int b;
    public void assignValues(int a, int b) {
        this.a = a;
        this.b = b;
    }
    public void assignValues(int value) {
        this.a = value;
        this.b = value;
    }
    public void printValues() {
        System.out.println("a: " + this.a + ", b: " + this.b);
    }
    public static void main(String[] args) {
        Overload obj = new Overload();
        obj.assignValues(10, 20);
        obj.printValues();
        obj.assignValues(30);
        obj.printValues();
    }
}
```



```
java -cp /tmp/8FVxBGdIJO/Overload
a: 10, b: 20
a: 30, b: 30

=== Code Execution Successful ===
```

7.Write a Java Program to count the number of words in a string using Hash Map.

```
import java.util.HashMap;
import java.util.Map;

public class WordCount {
    public static void main(String[] args) {
        String text = "This is a test. This test is only a test.";

        // Convert the string to lowercase and split it into words
        String[] words = text.toLowerCase().split("\\W+");

        // Create a HashMap to store the word count
        Map<String, Integer> wordCountMap = new HashMap<>();
        // Iterate through the words and update the count in the HashMap
        for (String word : words) {
            if (wordCountMap.containsKey(word)) {
                wordCountMap.put(word, wordCountMap.get(word) + 1);
            } else {
                wordCountMap.put(word, 1);
            }
        }

        // Print the word counts
        for (Map.Entry<String, Integer> entry : wordCountMap.entrySet()) {
            System.out.println(entry.getKey() + ": " + entry.getValue());
        }
    }
}
```



```
java -cp /tmp/oatwH7GcOo/WordCount
a: 2
test: 3
this: 2
only: 1
is: 2

=== Code Execution Successful ===
```

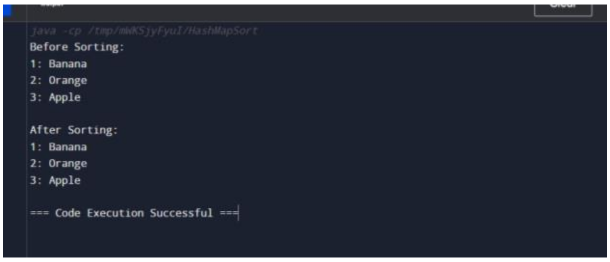
8.Write a Java Program to read an email and password from excel sheet by retrieving the cell using getRow() and getCell() method.

9. Write a Java program to sorts the given value using Hash Map.

CODE:

```
import java.util.*;
public class HashMapSort {
public static void main(String[] args) {
HashMap<Integer, String> map = new HashMap<>();
map.put(3, "Apple");
map.put(1, "Banana");
map.put(2, "Orange");
System.out.println("Before Sorting:");
for (Map.Entry<Integer, String> entry : map.entrySet()) {
System.out.println(entry.getKey() + ": " + entry.getValue());
}
Map<Integer, String> sortedMap = new TreeMap<>(map);
System.out.println("\nAfter Sorting:");
for (Map.Entry<Integer, String> entry : sortedMap.entrySet()) {
System.out.println(entry.getKey() + ": " + entry.getValue());
}
}
}
```

OUTPUT:



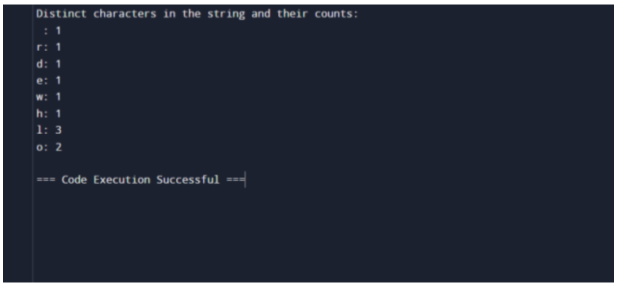
```
java -cp /tmp/mWKSjyFyuI/HashMapSort
Before Sorting:
1: Banana
2: Orange
3: Apple

After Sorting:
1: Banana
2: Orange
3: Apple

=== Code Execution Successful ===
```

10. Write a Java program to find distinct characters and their count in a string.

CODE:

```
import java.util.HashMap;
public class DistinctCharactersCount {
public static void main(String[] args) {
String str = "hello world";
HashMap<Character, Integer> charCountMap = new HashMap<>();
for (char c : str.toCharArray()) {
if (charCountMap.containsKey(c)) {
charCountMap.put(c, charCountMap.get(c) + 1);
} else {
charCountMap.put(c, 1);
}
}
System.out.println("Distinct characters in the string and their counts:");
for (char c : charCountMap.keySet()) {
System.out.println(c + ": " + charCountMap.get(c));
}
}
}
```

OUTPUT:



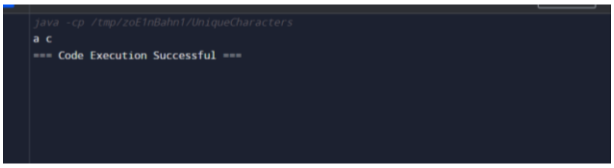
```
Distinct characters in the string and their counts:
 : 1
r: 1
d: 1
e: 1
w: 1
h: 1
l: 3
o: 2

=== Code Execution Successful ===
```

11. Write a program to print all the unique characters in a String. For instance, if the input string is “abcb”, the output will be the characters „a‟ and „c‟ as they are unique. The character
„b‟ repeats twice and so it will not be printed.

CODE:

```
import java.util.HashSet;
import java.util.Set;
public class UniqueCharacters {
public static void main(String[] args) {
String input = "abcb";
Set<Character> uniqueChars = new HashSet<>();
for (char c : input.toCharArray()) {
if (input.indexOf(c) == input.lastIndexOf(c)) {
```

```
uniqueChars.add(c);
}
}
for (char uniqueChar : uniqueChars) {
System.out.print(uniqueChar + " ");
}
}
}
```



```
java -cp /tmp/zoE1nBahn1/UniqueCharacters
a c
=== Code Execution Successful ===
```