LAB NO 1

INTRODUCTION TO STRING POOL, LITERALS, AND WRAPPER CLASSES

OBJECTIVE: To study the concepts of String Constant Pool, String literals, String immutability and Wrapper classes.

Question 1:

Write a program that initialize five different strings using all the above mentioned ways, i.e., a)string literals b)new keyword also use intern method and show string immutability.

INPUT:

```
public class JavaApp {

    public static void main(String[] args) {
        String s1="anas";
        String s2="shaheer";
        String s3="ayaan";
        String s4="ali";
        String s5="akbar";
        String s6=new String("talha");
         System.out.println(s1.intern());
         System.out.println(s2.intern());
         System.out.println(s3.intern());
         System.out.println(s4.intern());
         System.out.println(s5.intern());
         System.out.println(s6.intern());

    }
}
```

OUTPUT:

```
anas
shaheer
ayaan
ali
akbar
talha
```

Question 2:

Write a program to convert primitive data type Double into its respective wrapper object.

INPUT:

```
public class JavaApp {

    public static void main(String[] args) {
        double primitiveDouble = 10.5;
        Double wrapperDouble = primitiveDouble;
        System.out.println("P :" + primitiveDouble);
        System.out.println("W : " + wrapperDouble);
    }
}
```

OUTPUT:

```
P :10.5
W : 10.5
```

Question 3:

Write a program that initialize five different strings and perform the following operations. a. Concatenate all five stings. b. Convert fourth string to uppercase. c. Find the substring from the concatenated string from 8 to onward.

INPUT:

```
public class JavaApp {

    public static void main(String[] args) {


        String str1 = "My";
        String str2 = " name ";
        String str3 = " is";
        String str4 = " anas";
        String str5 = " ahmed";
        String concatenatedString = str1 + str2 + str3 + str4 + str5;
        System.out.println("Concatenated String: " + concatenatedString);
        System.out.println(str4.toUpperCase());
        String substringFrom8 = concatenatedString.substring(8);
        System.out.println("Substring from index 8 onward: " + substringFrom8);

    }
}
```

OUTPUT:

```
Concatenated String: My name  is anas ahmed
 ANAS
Substring from index 8 onward:  is anas ahmed
------------------------------------------------
BUILD SUCCESS
```

Question 4:

You are given two strings word1 and word2. Merge the strings by adding letters in alternating order, starting with word1. If a string is longer than the other, append the additional letters onto the end of the merged string. Return the merged string. Example: Input: word1 = "abc", word2 = "pqr" Output: "apbqcr" Explanation: The merged string will be merged as so: word1: a b c word2: p q r merged: a p b q

INPUT:

```
public class JavaApp {

    public static void main(String[] args) {
        String word1 = "abc";
        String word2 = "pqr";
        String mergedString = mergeAlternately(word1, word2);
        System.out.println("Merged String: " + mergedString);
    }

    public static String mergeAlternately(String word1, String word2) {
        StringBuilder result = new StringBuilder();
        int length1 = word1.length();
        int length2 = word2.length();
        int maxLength = Math.max(length1, length2);
        for (int i = 0; i < maxLength; i++) {
            if (i < length1) {
                result.append(word1.charAt(i));
            }
            if (i < length2) {
                result.append(word2.charAt(i));
            }
        }

        return result.toString();
    }
}
```

OUTPUT:

```
Merged String: apbqcr
BUILD SUCCESSFUL (total time: 0 seconds)
```

Question 5:

Write a Java program to find the minimum and maximum values of Integer, Float, and Double using the respective wrapper class constants.

INPUT:

```
public class JavaApp {

    public static void main(String[] args) {
        System.out.println("Integer:");
        System.out.println("Minimum Value: " + Integer.MIN_VALUE);
        System.out.println("Maximum Value: " + Integer.MAX_VALUE);
        System.out.println("\nFloat:");
        System.out.println("Minimum Value: " + Float.MIN_VALUE);
        System.out.println("Maximum Value: " + Float.MAX_VALUE);
        System.out.println("\nDouble:");
        System.out.println("Minimum Value: " + Double.MIN_VALUE);
        System.out.println("Maximum Value: " + Double.MAX_VALUE);
    }
```

OUTPUT:

```
Integer:
Minimum Value: -2147483648
Maximum Value: 2147483647

Float:
Minimum Value: 1.4E-45
Maximum Value: 3.4028235E38

Double:
Minimum Value: 4.9E-324
Maximum Value: 1.7976931348623157E308
```

HOME TASKS

Question 1:

Write a JAVA program to perform Autoboxing and also implement different methods of wrapper class.

INPUT:

```
public class JavaApp {

    public static void main(String[] args) {

        int intPrimitive = 42;
        Integer intWrapper = intPrimitive;
        System.out.println("Autoboxed Integer: " + intWrapper);

        double doublePrimitive = 3.14;
        Double doubleWrapper = doublePrimitive;
        System.out.println("Autoboxed Double: " + doubleWrapper);

        boolean boolPrimitive = true;
        Boolean boolWrapper = boolPrimitive;
        System.out.println("Autoboxed Boolean: " + boolWrapper);
        System.out.println("\nInteger as a String: " + intWrapper.toString());
        System.out.println("Integer + 10: " + (intWrapper + 10));

        System.out.println("\nDouble as a String: " + doubleWrapper.toString());
        System.out.println("Double * 2: " + (doubleWrapper * 2));

        System.out.println("\nBoolean as a String: " + boolWrapper.toString());
        System.out.println("Boolean OR false: " + (boolWrapper || false));
    }
}
```

OUTPUT:

```
Autoboxed Integer: 42
Autoboxed Double: 3.14
Autoboxed Boolean: true

Integer as a String: 42
Integer + 10: 52

Double as a String: 3.14
Double * 2: 6.28

Boolean as a String: true
Boolean OR false: true
```

Question 2:

Write a Java program to count the number of even and odd digits in a given integer using Autoboxing and Unboxing.

INPUT:

```
import java.util.Scanner;
public class JavaApp {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter an integer: ");
        int number = scanner.nextInt();
        scanner.close();
        Integer evenCount = 0;
        Integer oddCount = 0;
        number = Math.abs(number);
        while (number > 0) {
            int digit = number % 10;
            if (digit % 2 == 0) {
            } else {
                oddCount++;
            }
            number /= 10;
        }

        System.out.println("Number of even digits: " + evenCount);
        System.out.println("Number of odd digits: " + oddCount);
    }
}
```

OUTPUT:

```
Enter an integer: 5
Number of even digits: 0
Number of odd digits: 1
```

Question 3:

Write a Java program to find the absolute value, square root, and power of a number using Math class methods, while utilizing Autoboxing and Wrapper classes.

INPUT:

```
import java.util.Scanner;
public class JavaApp {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        Double number = scanner.nextDouble();
        scanner.close();
        Double absoluteValue = Math.abs(number);
        Double squareRoot = Math.sqrt(number);
        Double powerResult = Math.pow(number,2);

        System.out.println("Absolute value: " + absoluteValue);
        System.out.println("Square root: " + squareRoot);
        System.out.println("Power result: " + powerResult);
    }
}
```

OUTPUT:

```
Enter a number: 5
Absolute value: 5.0
Square root: 2.23606797749979
Power result: 25.0
--------------------------------
```

Question 4:

Write a Java program to reverse only the vowels in a string.

INPUT:

```
import java.util.Scanner;
public class JavaApp {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a string: ");
        String input = scanner.nextLine();
        scanner.close();

        String result = reverseVowels(input);
        System.out.println("String with reversed vowels: " + result);
    }

    public static String reverseVowels(String s) {
        char[] chars = s.toCharArray();
        String vowels = "AEIOUaeiou";
        int i = 0, j = s.length() - 1;
        while (i < j) {

            while (i < j && vowels.indexOf(chars[i]) == -1) {
                i++;
            }
            while (i < j && vowels.indexOf(chars[j]) == -1) {
                j--;
            }
            char temp = chars[i];
            chars[i] = chars[j];
            chars[j] = temp;
            i++;
            j--;
        }
        return new String(chars);
```

OUTPUT:

```
Enter a string: women
String with reversed vowels: wemon
```

Question 5:

Write a Java program to find the longest word in a sentence

INPUT:

```
import java.util.Scanner;
public class JavaApp {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a sentence: ");
        String sentence = scanner.nextLine();
        scanner.close();
        String longestWord = findLongestWord(sentence);
        System.out.println("The longest word is: " + longestWord);
    }

    public static String findLongestWord(String sentence) {

        String[] words = sentence.split(" ");

        String longestWord = "";

        for (String word : words) {

            if (word.length() > longestWord.length()) {
                longestWord = word;
            }
        }

        return longestWord;
    }
}
```

OUTPUT:

```
Enter a sentence: Anas ahmed
The longest word is: ahmed
---------------------------------
```