SAVEETHA SCHOOL OF ENGINEERING

SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES

INSTITUTE OF PLACEMENT AND TRAINING

CSA09 –JAVA PROGRAMMING

NAME : V.Trinath

REG.NO : 192311115

COURE CODE : CSA 0987

COURE NAME : JAVA PROGRAMMING.

ASSIGNMENT

String:

1. Write a program to reverse a word using loop? (Not to use inbuilt functions)
   Sample Input:
   String: TEMPLE
   Sample Output:
   Reverse String: ELPMET

reverse_word.java > Language Support for Java(TM) by Red Hat > reverse_word > main(String[])

```
public class reverse_word {
    Run main | Debug main | Run | Debug
    public static void main(String[] args)
    {
        String original="TEMPLE";
        String reverse="";
        for(int i=original.length()-1;i>=0;i--){
            reverse += original.charAt(i);
    }
    System.out.println("Reverse String: " + reverse);
  }
}

```

```
PROBLEMS 15  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS                    Run: reverse_word

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\jdk-17.0.11.9-hotspot\bin\java.exe' '
-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb8558
9\redhat.java\jdt_ws\java_d807b330\bin' 'reverse_word'
Reverse String: ELPMET
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

2. Write a program to convent the given string to integer?
   Sample Input:
   String: 1234
   Sample Output:
   Out put String: 1234

str_to_int.java > Language Support for Java(TM) by Red Hat > str_to_int > main(String[])

```java
public class str_to_int {
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        String input="1234";
        int result=0;
        for(int i=0; i<input.length();i++){
            int digit=input.charAt(i)-'0';
            result = result*10+digit;
        }
        System.out.println("Output integer:"+result);
    }
}
```

```
PROBLEMS 15  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS                    Run: str_to_int

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\jdk-17.0.11.9-hotspot\bin\java.exe'
'-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb85
589\redhat.java\jdt_ws\java_d807b330\bin' 'str_to_int'
Output integer:1234
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

3. Write a program to check the entered user name is valid or not. Get both the inputs from the user.

validname.java > ...

```java
import java.util.Scanner;
public class validname {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter a username: ");
        String username = scanner.nextLine();
        boolean isValid = isValidUsername(username);
        if (isValid) {
            System.out.println(x:"The username is valid.");
        } else {
            System.out.println(x:"The username is invalid.");
        }
        scanner.close();
    }
    public static boolean isValidUsername(String username) {
        if (username.length() < 5 || username.length() > 15) {
            return false;
        }
        for (int i = 0; i < username.length(); i++) {
            char ch = username.charAt(i);
            if (!Character.isLetterOrDigit(ch)) {
                return false;
            }
        }
        return true;
    }
}
```

```
PROBLEMS 17  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS                Run: validname

PS C:\Users\ydaya\OneDrive\Desktop\java> & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\jdk-17.0.11.9-hotspot\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb85589\redhat.java\jdt_ws\java_d807b330\bin' 'validname'
Enter a username: Dayakar
The username is valid.
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

4. Write a program that would sort a list of names in alphabetical order Ascending or Descending, choice get from the user?

Sample Input:

Banana
Carrot
Radish
Apple
Jack
Order(A/D) : A

Sample Output:

Apple
Banana
Carrot
Jack
Radish

```java
import java.util.*;
public class NameSorter {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        List<String> names = Arrays.asList(...a:"Banana", "Carrot", "Radish", "Apple", "Jack");
        System.out.println(x:"Sample Input:");
        names.forEach(System.out::println);
        Collections.sort(names);
        System.out.println(x:"\nSorted names in ascending order:");
        names.forEach(System.out::println);
        Collections.sort(names, Collections.reverseOrder());
        System.out.println(x:"\nSorted names in descending order:");
        names.forEach(System.out::println);
    }
}
```

```
PROBLEMS 17  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

Banana
Carrot
Jack
Radish

Sorted names in descending order:
Radish
Jack
Carrot
Banana
Apple
```

5. Write a program to print the special characters separately and print number of Special characters in the line?

```java
import java.util.Scanner;
public class SpecialCharactercount {
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        Scanner word= new Scanner(System.in);
        System.out.print(s:"Enter a string:");
        String messege=word.nextLine();
        int specialcharactercount=0;
        for (int i=0;i<messege.length();i++){
            char ch=messege.charAt(i);
            if(!(Character.isLetterOrDigit(ch)|| Character.isWhitespace(ch))) {
                System.out.println(ch);
                specialcharactercount++;
            }
        }
        System.out.println(specialcharactercount);
        word.close();
    }
}
```

```
Enter a string:Dayakar@123
@
1
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

6. Write a program to print the number of vowels in the given statement?
Sample Input:
Saveetha School of Engineering
Sample Output:
Number o vowels = 12

```java
import java.util.Scanner;
public class countvowels{
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        Scanner string=new Scanner(System.in);
        System.out.print("Enter a sentence: ");
        String messege=string.nextLine();
        int count=0;
        for(int i=0;i<messege.length();i++){
            char ch=messege.charAt(i);
            if(ch=='a' || ch=='e' || ch=='i' || ch == 'o'  || ch == 'u'){
                count++;
            }
        }
        System.out.println(count);
        string.close();
    }
}
```

```
Enter a sentence: Dayakar Reddy
4
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

7. Write a program to print consonants and vowels separately in the given word
Sample Input:
Given Word: Engineering
Sample Output:
Consonants: n g n r n g
Vowels: e i e ei

```java
public class vowelsandconsonents {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        String line="Dayakarreddy";
        int vowels=0;
        int consonent=0;
        for (int i=0;i<line.length();i++){
            char ch=line.charAt(i);
            if(ch=='a' || ch=='e'|| ch=='i'|| ch=='o'|| ch=='u'){
                vowels++;
            } else {
                consonent++;
            }
        }
        System.out.println(vowels);
        System.out.println(consonent);
    }
}
```

```
4
8
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

8. Write a program that finds whether a given character is present in a string or not. In case it is present it prints the index at which it is present. Do not use built-in find functions to search the character.
Sample Input:

Enter the string: I am a programmer
Enter the character to be searched: p

Sample Output:

P is found in string at index: 8

```java
public class CharacterFinder {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        String str="I am a programmer";
        char ch='p';
        int index=findCharacter(str,ch);
        if (index != -1) {
            System.out.println(ch+"is found in string at index:"+index);
        }
    }
    public static int findCharacter(String str, char ch) {
        char[] charArray = str.toCharArray();
        for (int i=0;i<charArray.length;i++) {
            if (charArray[i]==ch) {
                return i;
            }
        }
        return -1;
    }
}
```

```
pis found in string at index:7
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

9. Write a program to arrange the letters of the word alphabetically in reverse order

Sample Input:

Enter the word: MOSQUE

Sample Output:

Alphabetical Order: U S Q O M E

```java
import java.util.Arrays;
import java.util.Scanner;
public class alphabaticallyreverse{
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        Scanner scanner=new Scanner(System.in);
        System.out.println(x:"enter the sentence:");
        String word=scanner.nextLine();
        scanner.close();
        char [] letters=word.toCharArray();
        Arrays.sort(letters);
        System.out.println(x:"alphabatic order =");
        for (int i=letters.length-1;i>=0;i--){
            System.out.println(letters[i]+ " ");
        }
    }
}
```

```
enter the sentence:
dayakar
alphabatic order =
y
r
k
d
a
a
a
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

10. Write a program that accepts a string from user and displays the same string after removing vowels from it.

Sample Input & Output:

Enter a string: we can play the game

The string without vowels is: w cn ply thgm

```java
import java.util.Scanner;
public class Removevowelsinsentence {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print(s:"Enter a string: ");
        String inputString = sc.nextLine();
        String result = removeVowels(inputString);
        System.out.println("The string without vowels is: " + result);
        sc.close();
    }
    public static String removeVowels(String str) {
        return str.replaceAll(regex:"[aeiouAEIOU]", replacement:"");
    }
}
```

```
Enter a string: saveetha university
The string without vowels is: svth nvrsty
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

ASSIGNMENT-2:

Arrays:

11. Write a program for matrix multiplication?

Sample Input:

Mat1 = 1 2
5 3

Mat2 = 2 3
4 1

Sample Output:

Mat Sum = 10 5
22 18

```java
import java.util.Scanner;
public class matrixmultiplication {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int[][] mat1 = new int[2][2];
        int[][] mat2 = new int[2][2];
        System.out.println(x:"Enter elements of the first matrix (2x2):");
        for (int i = 0; i < 2; i++) {
            for (int j = 0; j < 2; j++) {
                mat1[i][j] = input.nextInt();
            }
        }
        System.out.println(x:"Enter elements of the second matrix (2x2):");
        for (int i = 0; i < 2; i++) {
            for (int j = 0; j < 2; j++) {
                mat2[i][j] = input.nextInt();
            }
        }
        int[][] result = new int[2][2];
        for (int i = 0; i < 2; i++) {
            for (int j = 0; j < 2; j++) {
                for (int k = 0; k < 2; k++) {
                    result[i][j] += mat1[i][k] * mat2[k][j];
                }
            }
        }
        System.out.println(x:"Matrix Multiplication Result:");
        for (int i = 0; i < 2; i++) {
            for (int j = 0; j < 2; j++) {
                System.out.print(result[i][j] + " ");
            }
            System.out.println();
        }
    }
}
```

```
Enter elements of the first matrix (2x2):
1
2
5
3
Enter elements of the second matrix (2x2):
2
3
4
1
Matrix Multiplication Result:
10 5
22 18
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

12. Write a program for matrix addition?

Sample Input:

Mat1 = 1 2
5 3

Mat2 = 2 3

4 1

Sample Output:

Mat Sum = 3 5

9 4

```java
import java.util.Scanner;
public class matrixaddition {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println(x:"Enter the number of rows and columns for the matrices:");
        int rows = input.nextInt();
        int columns = input.nextInt();
        int[][] matrix1 = new int[rows][columns];
        int[][] matrix2 = new int[rows][columns];
        int[][] sumMatrix = new int[rows][columns];
        System.out.println(x:"Enter the elements of the first matrix:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < columns; j++) {
                matrix1[i][j] = input.nextInt();
            }
        }
        System.out.println(x:"Enter the elements of the second matrix:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < columns; j++) {
                matrix2[i][j] = input.nextInt();
            }
        }
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < columns; j++) {
                sumMatrix[i][j] = matrix1[i][j] + matrix2[i][j];
            }
        }
        System.out.println(x:"Matrix Sum:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < columns; j++) {
                System.out.print(sumMatrix[i][j] + " ");
            }
            System.out.println();
            input.close();
        }
    }
}
```

```
Enter the number of rows and columns for the matrices:
2
2
Enter the elements of the first matrix:
1
2
5
3
Enter the elements of the second matrix:
2
3
4
1
Matrix Sum:
3 5
9 4
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

13. Write a program for Merge two sorted arrays using Array list

Input: arr1[] = { 1, 3, 4, 5}, arr2[] = {2, 4, 6, 8}

Output: arr3[] = {1, 2, 3, 4, 4, 5, 6, 8}

```java
import java.util.ArrayList;
import java.util.Collections;
import java.util.Scanner;
public class mergelist {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the size of the first array: ");
        int size1 = scanner.nextInt();
        int[] arr1 = new int[size1];
        System.out.println(x:"Enter the elements of the first array:");
        for (int i = 0; i < size1; i++) {
            arr1[i] = scanner.nextInt();
        }
        System.out.print(s:"Enter the size of the second array: ");
        int size2 = scanner.nextInt();
        int[] arr2 = new int[size2];
        System.out.println(x:"Enter the elements of the second array:");
        for (int i = 0; i < size2; i++) {
            arr2[i] = scanner.nextInt();
        }
       ArrayList<Integer> mergedList = new ArrayList<>();

        for (int num : arr1) {
            mergedList.add(num);
        }
        for (int num : ar
            mergedList.ad
        }
        Collections.sort(mergedList);
        System.out.println("Merged and Sorted Array: " + mergedList);
    }
}
```

ArrayList<Integer> mergedList

ArrayList<Integer> mergedList - mergelist.main(String[])

```
Enter the size of the first array: 3
Enter the elements of the first array:
5
9
1
Enter the size of the second array: 3
Enter the elements of the second array:
7
2
8
Merged and Sorted Array: [1, 2, 5, 7, 8, 9]
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

14. Find the Mean, Median, Mode of the array of numbers?

Sample Input;:

Array of elements = {16, 18, 27, 16, 23, 21, 19}

Sample Output:

Mean = 20

Median = 19

Mode = 16

```java
import java.util.*;
public class MeanMedianMode {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        int[] arr = {16, 18, 27, 16, 23, 21, 19};
        double sum = 0;
        for (int num : arr) {
            sum += num;
        }
        double mean = sum / arr.length;
        System.out.println("Mean = " + mean);
        Arrays.sort(arr);
        double median;
        if (arr.length % 2 == 0) {
            median = (arr[arr.length/2 - 1] + arr[arr.length/2]) / 2.0;
        } else {
            median = arr[arr.length/2];
        }
        System.out.println("Median = " + median);
        int mode = 0;
        int maxCount = 0;
        for (int num : arr) {
            int count = 0;
            for (int value : arr) {
                if (value == num) {
                    count++;
                }
            }
            if (count > maxCount) {
                maxCount = count;
                mode = num;
            }
        }
        System.out.println("Mode = " + mode);
    }
}
```

```
Mean = 20.0
Median = 19.0
Mode = 16
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

15. Write a program to find the number of composite numbers in an array of elements
Sample Input;:
Array of elements = {16, 18, 27, 16, 23, 21, 19}
Sample Output:
Number of Composite Numbers = 5

```java
public class CompositeNumbers {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        int[] numbers = {16, 18, 27, 16, 23, 21, 19};
        int compositeCount = countCompositeNumbers(numbers);
        System.out.println("Number of Composite Numbers = " + compositeCount);
    }
    public static boolean isComposite(int number) {
        if (number <= 1) {
            return false;
        }
        for (int i = 2; i <= Math.sqrt(number); i++) {
            if (number % i == 0) {
                return true;
            }
        }
        return false;
    }
    public static int countCompositeNumbers(int[] numbers) {
        int count = 0;
        for (int number : numbers) {
            if (isComposite(number)) {
                count++;
            }
        }
        return count;
    }
}
```

```
Number of Composite Numbers = 5
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

Patterns :

16. Write a program to print Right Triangle Star Pattern

Sample Input:: n = 5

Output:

```
*
* *
* * *
* * * *
* * * * *
```

```java
import java.util.Scanner;
public class Starpattern {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner=new Scanner(System.in);
        System.out.print(s:"Enter a number");
        int n=scanner.nextInt();

for (int i=1;i<=n;i++){
    for(int j=i;j<n;j++){
        System.out.print(s:"");
    }
    for(int j=1;j<=i;j++){
        System.out.print(s:"* ");
    }
    System.out.println();
    scanner.close();
}
  }
}
```

```
Enter a number5
*
* *
* * *
* * * *
* * * * *
```

17. Write a program to print the below pattern?

```
                1
            1       1
        1       2       1
    1       3       3       1
1       4       6       4       1
```

```java
import java.util.Scanner;
public class numberspattern {
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        Scanner aa=new Scanner(System.in);
        System.out.print(s:"Enter a number:");
        int n=aa.nextInt();
        int[][] triangle=new int[n][n];
        for(int i=0;i<n;i++){
            for(int j=0;j<=i;j++){
                if(j==0|| j==i){
                    triangle[i][j]=1;
                } else {
                    triangle[i][j]=triangle[i-1][j-1]+triangle[i-1][j];
                }
            }
        }
        for(int i=0;i<n;i++){
            for (int k=0;k<n-i;k++){
                System.out.print(s:"  ");
            }
            for(int j=0;j<=i;j++){
                System.out.print(triangle[i][j]+"   ");
            }
            System.out.println();
            aa.close();
        }
    }
}
```

```
Enter a number:5
        1
      1   1
    1   2   1
  1   3   3   1
1   4   6   4   1
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

18. Write a program to print rectangle symbol pattern.

Get the symbol as input from user

```java
import java.util.Scanner;
public class rectanglepattern {
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        Scanner aa=new Scanner(System.in);
        System.out.print(s:"Enter rows:");
        int rows=aa.nextInt();
        System.out.print(s:"Enter cols");
        int cols=aa.nextInt();
        System.out.print(s:"Enter symbol");
        char symbol=aa.next().charAt(index:0);
        for (int i=0;i<rows;i++){
            for(int j=0;j<cols;j++){
                System.out.print(symbol+" ");
            }
            System.out.println();
            aa.close();
        }
    }
}
```

```
Enter rows:4
Enter cols6
Enter symbol%
% % % % % %
% % % % % %
% % % % % %
% % % % % %
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

19. Write a program to print the following pattern

Sample Input:

Enter the number to be printed: 1

Max Number of time printed: 3

1

11

111

11

1

```java
import java.util.Scanner;
public class maxnumber {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the number: ");
        int number = scanner.nextInt();
        System.out.print(s:"Enter the maximum to be printed: ");
        int maxTimes = scanner.nextInt();
        printPattern(number, maxTimes);
        scanner.close();
    }
    public static void printPattern(int number, int maxTimes) {
        for (int i = 1; i <= maxTimes; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(number);
            }
            System.out.println();
        }
        for (int i = maxTimes - 1; i >= 1; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print(number);
            }
            System.out.println();
        }
    }
}
```

```
Enter the number: 1
Enter the maximum to be printed: 4
1
11
111
1111
111
11
1
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

20. Write a program to print the Inverted Full Pyramid pattern?

```java
import java.util.Scanner;
public class pyramid {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner=new Scanner(System.in);
        System.out.print(s:"Enter a number");
        int n=scanner.nextInt();
for (int i=1;i<=n;i++){
    for(int j=i;j<n;j++){
        System.out.print(s:"  ");
    }
    for(int j=1;j<=i;j++){
        System.out.print(s:"*  ");
    }
    System.out.println();
    scanner.close();
}
}
}
```

```
Enter a number5
        *
      *  *
    *  *  *
  *  *  *  *
*  *  *  *  *
```

ASSIGNMENT-3:

21. Write a program to print the following pattern

Sample Input:

Enter the Character to be printed: %

Max Number of time printed: 3

```
%
% %
% % %
```

```java
import java.util.Scanner;
public class symbolpattern {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner=new Scanner(System.in);
        System.out.print(s:"Enter a number");
        int n=scanner.nextInt();

for (int i=1;i<=n;i++){
    for(int j=i;j<n;j++){
        System.out.print(s:"");
    }
    for(int j=1;j<=i;j++){
        System.out.print(s:"% ");
    }
    System.out.println();
    scanner.close();
}
  }
}
```

```
Enter a number3
%
% %
% % %
```

22. Write a program to print hollow square symbol pattern?

```java
import java.util.Scanner;

public class HollowSquareDollarPattern {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the size of the square: ");
        int n = scanner.nextInt();
        scanner.close();
        for (int i = 0; i < n; i++) {
            for (int j = 0; j < n; j++) {
                if (i == 0 || i == n - 1 || j == 0 || j == n - 1) {
                    System.out.print(s:"$ ");
                } else {
                    System.out.print(s:"  ");
                }
            }
            System.out.println();
        }
    }
}
```

```
Enter the size of the square: 4
$ $ $ $
$     $
$     $
$ $ $ $
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

23. Write a program to print the below pattern

1
2 2
3 3 3
4 4 4 4

```java
import java.util.Scanner;
public class samenumbertrianglepattern {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner aa = new Scanner(System.in);
        System.out.print(s:"Enter the number of rows: ");
        int rows = aa.nextInt();
        for (int i = 1; i <= rows; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(i + " ");
            }
            System.out.println();
            aa.close();
        }
    }
}
```

```
Enter the number of rows: 5
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

24. Write a program to print the below pattern

```
1
4   9
16  25  36
49  64  81  100
```

```java
import java.util.Scanner;
public class squarenumberpattern {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner aa = new Scanner(System.in);
        System.out.print(s:"Enter the number of rows: ");
        int num = aa.nextInt();
        int number=1;
        for (int i = 1; i <= num; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print((number*number)+ " ");
                number++;
            }
            System.out.println();
            aa.close();
        }
    }
}
```

```
Enter the number of rows: 4
1
4 9
16 25 36
49 64 81 100
```

25. Write a program to print the below pattern

```
1
2 2
3  3  3
4  4   4   4
3  3  3
2  2
1
```

```java
public class samenumberpatternfull {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        int n = 4;
        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(i + " ");
            }
            System.out.println();
        }
        for (int i = n - 1; i >= 1; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print(i + " ");
            }
            System.out.println();
        }
    }
}
```

```
PROBLEMS 24  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\jdk-17.0.
s' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb85589\redhat.j
1
2 2
3 3 3
4 4 4 4
3 3 3
2 2
1
```

26. Write a program to print hollow Square Dollar pattern?

```java
import java.util.Scanner;

public class HollowSquareDollarPattern {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the size of the square: ");
        int n = scanner.nextInt();
        scanner.close();
        for (int i = 0; i < n; i++) {
            for (int j = 0; j < n; j++) {
                if (i == 0 || i == n - 1 || j == 0 || j == n - 1) {
                    System.out.print(s:"$ ");
                } else {
                    System.out.print(s:"  ");
                }
            }
            System.out.println();
        }
    }
}
```

```
Enter the size of the square: 4
$ $ $ $
$     $
$     $
$ $ $ $
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

27. Write a program to print inverted pyramid pattern.
Input: no of rows: 3
Output

```
*****
 ***
  *
```

```java
import java.util.Scanner;
public class invertedpyramid {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner=new Scanner(System.in);
        System.out.print(s:"Enter a number");
        int n=scanner.nextInt();

for (int i=n;i>=1;i--){
    for(int j=0;j<n-i;j++){
        System.out.print(s:"  ");
    }
    for(int j=0;j<2*i-1;j++){
        System.out.print(s:"* ");
    }
    System.out.println();
    scanner.close();
}
  }
}
```

```
Enter a number4
* * * * * * *
  * * * * *
    * * *
      *
```

General:

28. Write a program to reverse a number using loop?(Get the input from user)

Sample Input:

Number: 14567

Sample Output:

Reverse Number: 76541

```java
import java.util.Scanner;

public class ReverseNumber {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter a number: ");
        int number = scanner.nextInt();
        int reversed = 0;
        while (number != 0) {
            int digit = number % 10;
            reversed = reversed * 10 + digit;
            number /= 10;
        }
        System.out.println(reversed);
    }
}
```

```
Enter a number: 14567
76541
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

29. Write a program to convert the given decimal to binary and print the reverse of the binary decimal.

Input: 11

Output: 13
Explanation: (11)10 = (1011)2.

```java
import java.util.Scanner;
public class DecimalToReversedBinary {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter a decimal number: ");
        int decimalNumber = scanner.nextInt();
        String binaryNumber = convertToBinary(decimalNumber);
        String reversedBinaryNumber = reverseString(binaryNumber);
        System.out.println("Reversed Binary Number: " + reversedBinaryNumber);
        scanner.close();
    }
    public static String convertToBinary(int decimalNumber) {
        StringBuilder binaryNumber = new StringBuilder();
        if (decimalNumber == 0) {
            return "0";
        }
        while (decimalNumber > 0) {
            int remainder = decimalNumber % 2;
            binaryNumber.append(remainder);
            decimalNumber /= 2;
        }
        binaryNumber.reverse();
        return binaryNumber.toString();
    }
    public static String reverseString(String input) {
        StringBuilder reversed = new StringBuilder(input);
        reversed.reverse();
        return reversed.toString();
    }
}
```

```
Enter a decimal number: 6
Reversed Binary Number: 011
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

30. Write a program to find whether the person is eligible for vote or not. And if that particular person is not eligible, then print how many years are left to be eligible.
Sample Input:
Enter your age: 7
Sample output:
You are allowed to vote after 11 years

```java
import java.util.Scanner;

public class VotingEligibility {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter your age: ");
        int age = scanner.nextInt();
        int votingAge = 18;
        if (age >= votingAge) {
            System.out.println(x:"You are eligible to vote.");
        } else {
            int yearsLeft = votingAge - age;
            System.out.println("You are allowed to vote after " + yearsLeft + " years.");
        }
    }
}
```

```
Enter your age: 15
You are allowed to vote after 3 years.
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

ASSIGNMENT-4:

31. Find the LCM and GCD of n numbers?

Sample Input:

N value = 2

Number 1 = 16

Number 2 = 20

Sample Output:

LCM = 80

GCD = 4

LCMAndGCD.java > Language Support for Java(TM) by Red Hat > LCMAndGCD > calculateLCM(int, int, int)

```java
import java.util.Scanner;
public class LCMAndGCD{
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner aa=new Scanner(System.in);
        System.out.print(s:"Enter a first number:");
        int num1=aa.nextInt();
        System.out.print(s:"Enter a second number:");
        int num2=aa.nextInt();
        int gcd=calculateGCD(num1,num2);
        int lcm=calculateLCM(num1,num2,gcd);
        System.out.println("GCD of "+num1+" and "+num2+" is: "+gcd);
        System.out.println("GCD of "+num1+" and "+num2+" is: "+lcm);
        aa.close();
    }
    public static int calculateGCD(int a,int b){
        while(b!=0){
            int temp=b;
            b=a%b;
            a=temp;
        }
        return a;
    }
    public static int calculateLCM(int a,int b,int gcd){
        return(a*b)/gcd;
    }
}
```

PROBLEMS 11 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\jdk-17.0.11.9-hotspot\bin\java.e
ssages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb85589\redhat.java\jdt_ws\java_d8
Enter a first number:5
Enter a second number:9
GCD of 5 and 9 is: 1
GCD of 5 and 9 is: 45
```

32. Write a program using function to calculate the simple interest. Suppose the customer is a senior citizen. He is being offered 12 percent rate of interest; for all other customers, the ROI is 10 percent.

Sample Input:

Enter the principal amount: 200000

Enter the no of years: 3

Is customer senior citizen (y/n): n

Sample Output:

Interest: 60000

```java
import java.util.Scanner;

public class SimpleInterestCalculator {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner aa= new Scanner(System.in);
        System.out.print(s:"Enter the principal amount: ");
        double principal = aa.nextDouble();
        System.out.print(s:"Enter the number of years: ");
        int years = aa.nextInt();
        System.out.print(s:"Is customer senior citizen (y/n): ");
        char isSeniorCitizen = aa.next().charAt(index:0);
        double interest = calculateInterest(principal, years, isSeniorCitizen == 'y' || isSeniorCitizen == 'Y');
        System.out.println("Interest: " + interest);
        aa.close();
    }
    public static double calculateInterest(double principal, int years, boolean isSeniorCitizen) {
        double rateOfInterest = isSeniorCitizen ? 0.12 : 0.10;
        return principal * rateOfInterest * years;
    }
}
```

```
PROBLEMS 12  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\jdk-17.0.11.9-hotspot\bin\
ssages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb85589\redhat.java\jdt_ws\s

Enter the principal amount: 200000
Enter the number of years: 3
Is customer senior citizen (y/n): 2
Interest: 60000.0
PS C:\Users\ydaya\OneDrive\Desktop\java>
```

33. Write a program to print the Fibonacci series.

Sample Input:

Enter the n value: 6

Sample Output:

0 1 1 2 3 5

```java
import java.util.Scanner;
public class fibonaccifunction {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the n value: ");
        int n = scanner.nextInt();
        printFibonacciSeries(n);
        scanner.close();
    }
    public static void printFibonacciSeries(int n) {
        int num1 = 0, num2 = 1;
        for (int i = 1; i <= n; i++) {
            System.out.print(num1 + "\t");
            int nextNumber = num1 + num2;
            num1 = num2;
            num2 = nextNumber;
        }
    }
}
```

```
PROBLEMS 13  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptiu
s' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb855
Enter the n value: 5
0       1       1       2       3
```

34. Java Program to Find Even Sum of Fibonacci Series Till number N?

Sample Input: n = 4

Sample Output: 2

```java
import java.util.Scanner;

public class EvenSumFibonacci {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the n value: ");
        int n = scanner.nextInt();
        int evenSum = calculateEvenSumFibonacci(n);
        System.out.println("Even sum of Fibonacci series till number "+n+": "+evenSum);
        scanner.close();
    }
    public static int calculateEvenSumFibonacci(int n) {
        int num1 = 0, num2 = 1, evenSum = 0;
        for (int i = 1; i <= n; i++) {
            int nextNumber = num1 + num2;
            num1 = num2;
            num2 = nextNumber;
            if (num1 % 2 == 0) {
                evenSum += num1;
            }
        }
        return evenSum;
    }
}
```

```
PROBLEMS 14  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\
ssages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb
Enter the n value: 5
Even sum of Fibonacci series till number 5: 2
```

35. Write a program to print the numbers from M to N by skipping K numbers in between?

Sample Input:

M = 50

N = 100

K = 7

Sample Output:

50, 58, 66, 74, …..

```java
import java.util.Scanner;
public class SkipNumbers {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the starting number (M): ");
        int M = scanner.nextInt();
        System.out.print(s:"Enter the ending number (N): ");
        int N = scanner.nextInt();
        System.out.print(s:"Enter the number to skip (K): ");
        int K = scanner.nextInt();
        printSkippedNumbers(M, N, K);
        scanner.close();
    }
    public static void printSkippedNumbers(int M, int N, int K) {
        for (int i = M; i <= N; i += K) {
            System.out.print(i);
            if (i + K <= N) {
                System.out.print(s:", ");
            }
        }
        System.out.println();
    }
}
```

```
PROBLEMS 15  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\jdk-
s' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb85589\rec
Enter the starting number (M): 0
Enter the ending number (N): 50
Enter the number to skip (K): 5
0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50
```

36. Write a program to print all the composite numbers between a and b?

Sample Input:

```java
import java.util.Scanner;
public class compositenumber {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the value of A: ");
        int A = scanner.nextInt();
        System.out.print(s:"Enter the value of B: ");
        int B = scanner.nextInt();
        System.out.print("Composite numbers between " + A + " and " + B + " are: ");
        for (int i = A; i <= B; i++) {
            if (isComposite(i)) {
                System.out.print(i + " ");
            }
        }
        scanner.close();
    }
    public static boolean isComposite(int num) {
        if (num <= 1) {
            return false;
        }
        for (int i = 2; i <= num / 2; i++) {
            if (num % i == 0) {
                return true;
            }
        }
        return false;
    }
}
```

```
PROBLEMS 24  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\Eclipse Adopt
s' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746fb8
Enter the value of A: 12
Enter the value of B: 18
Composite numbers between 12 and 18 are: 12 14 15 16 18
```

A = 12

B = 19

Sample Output

14, 15, 16, 18

37. Find the factorial of n?

Sample Input:

N = 4

Sample Output:

4 Factorial = 24

```java
import java.util.Scanner;

public class Factorial {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter the value of N: ");
        int N = scanner.nextInt();
        long factorial = calculateFactorial(N);
        System.out.println(N + " Factorial = " + factorial);
        scanner.close();
    }
    public static long calculateFactorial(int num) {
        long result = 1;
        for (int i = 1; i <= num; i++) {
            result *= i;
        }
        return result;
    }
}
```

```
PROBLEMS 17  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Progra
ssages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459
Enter the value of N: 5
5 Factorial = 120
```

38. Find the year of the given date is leap year or not

Sample Input:

Enter Date: 04/11/1947

Sample Output:

Given year is Non Leap Year

```java
import java.util.Scanner;
public class LeapYearChecker {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner aa = new Scanner(System.in);
        System.out.print(s:"Enter Date (dd/MM/yyyy): ");
        int year = aa.nextInt();

        if (isLeapYear(year)) {
            System.out.println(x:"Given year is a Leap Year");
        } else {
            System.out.println(x:"Given year is Non Leap Year");
        }
        aa.close();
    }
    public static boolean  isLeapYear(int year) {
        return (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0);
    }
}
```

```
PROBLEMS 18  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
PS C:\Users\yda  Open folder in new window (ctrl + click)  Users\ydaya\AppData\Local\Programs\Eclipse Adoptium\
ssages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5eacaea27a3b746f
Enter Date (dd/MM/yyyy): 04111947
Given year is Non Leap Year
```

39. Find the number of factors for the given number

Sample Input:

Given number: 100

Sample Output:

Number of factors = 9

```java
import java.util.Scanner;
public class NumberOfFactors {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner=new Scanner(System.in);
        System.out.print(s:"Enter a number to find its factors: ");
        int number=scanner.nextInt();
        int countFactors=countFactors(number);
        System.out.println("Number of factors = "+countFactors);
        scanner.close();
    }
    public static int countFactors(int number) {
        int count=0;
        for (int i=1;i<=number;i++) {
            if (number%i==0) {
                count++;
            }
        }
        return count;
    }
}
```

```
PROBLEMS 20  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\
ssages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba
Enter a number to find its factors: 100
Number of factors = 9
```

40. Write a program to print the given number is Perfect number or not?

Sample Input:

Given Number: 6

Sample Output:

It’s a Perfect Number

```java
import java.util.Scanner;
public class PerfectNumber {
    Run main | Debug main | Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print(s:"Enter a number: ");
        int number = scanner.nextInt();
        int sum = 1;
        for (int i = 2; i * i <= number; i++) {
            if (number % i == 0) {
                sum += i;
                if (i != number / i) {
                    sum += number / i;
                }
            }
        }
        if (sum == number && number > 1) {
            System.out.println(x:"It?s a Perfect Number");
        } else {
            System.out.println(x:"It?s not a Perfect Number");
        }
        scanner.close();
    }
}
```

```
PROBLEMS 21   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

PS C:\Users\ydaya\OneDrive\Desktop\java>  & 'C:\Users\ydaya\AppData\Local\Programs\E
ssages' '-cp' 'C:\Users\ydaya\AppData\Roaming\Code\User\workspaceStorage\bdb5459eba5
Enter a number: 6
It?s a Perfect Number
```