

Java Lab Exercise

Ex. No. 1	Basic Programs
Date of Exercise	01-12-2017

Aim:

To develop Java programs for the following problems:

1. WAP in java to implement the factorial of a given number.
2. WAP to grade the student using java.
3. WAP to perform Tribonacci series of given number
4. WAP to identify the prime numbers between the given range.
5. WAP to achieve the following pattern,

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

Algorithm:

1.To implement the factorial of a given number.

- 1) Start.
- 2) Read the number from user of which the factorial is to be found and store it in n.
- 3) Initialize fact=1.
- 4) Initialize a for loop which starts from i = n till i > 1.
- 5) Inside the loop calculate sum as fact = fact * i.
- 6) Display the result.
- 7) End.

Java Lab Exercise

Source Code:

```
package exp1;

import java. util. Scanner;

public class factorial {

    public static void main(String [] args) {

        Scanner S=new Scanner(System.in);

        int n;

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

        n=S.nextInt();

        int fact=1;

        for(int i = n; i > 1; i--){

            Fact = i * fact;

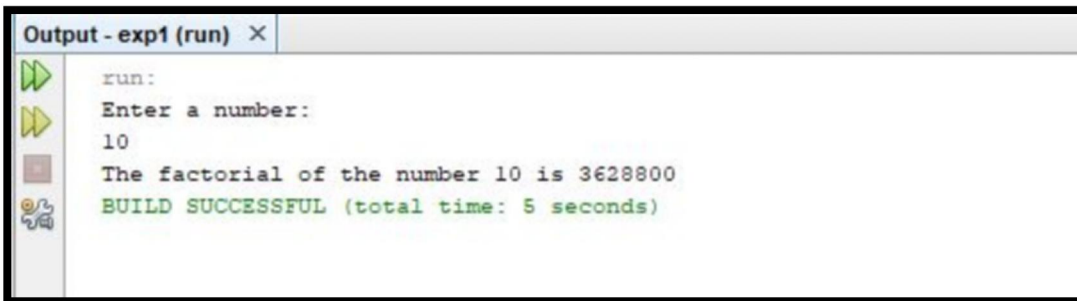
        }

        System.out.println("The factorial of the number " +n+ " is " + fact);

    }}


```

Input & Output:

A screenshot of a Java IDE's output window titled "Output - exp1 (run)". The window shows the execution of the factorial program. It starts with "run:", followed by the prompt "Enter a number:" and the user input "10". The output then displays "The factorial of the number 10 is 3628800". At the bottom, it states "BUILD SUCCESSFUL (total time: 5 seconds)". On the left side of the window, there are icons for running, stepping through, and debugging the code.

```
run:
Enter a number:
10
The factorial of the number 10 is 3628800
BUILD SUCCESSFUL (total time: 5 seconds)
```

Algorithm:

2.To grade the student using Java.

- 1) Start.
- 2) Read the marks from user of which the grade is to be found and store it in marks.
- 3) Declare a string variable grade as Null.
- 4) Using if-else-if ladder calculate the grade according to the marks entered.
- 5) Display the result.
- 6) End.

Source Code:

```
package exp1;

import java.util.Scanner;

public class stugrade {

    public static void main(String args[]){

        Scanner s=new Scanner(System.in);

        int marks;

        String Grade = null;

        System.out.println("Enter the mark of a subject: ");

        marks=s.nextInt();

        if(marks>=95)

            Grade="O";

        else if(marks>=90&&marks<95)

            Grade="S";

        else if(marks>=80&&marks<90)

            Grade="A";

        else if(marks>=70&&marks<80)

            Grade="B";

        else if(marks>=60&&marks<70)
```

Java Lab Exercise

```
        Grade="C";

    else if(marks>=50&&marks<60)

        Grade="D";

    else

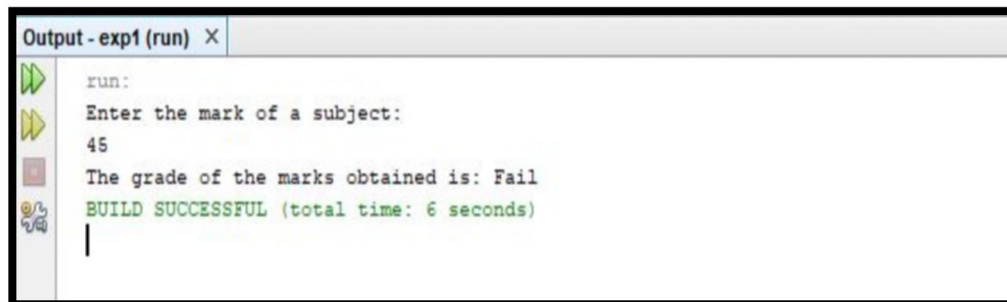
        Grade="Fail";

    System.out.println("The grade of the marks obtained is: "+Grade);

}

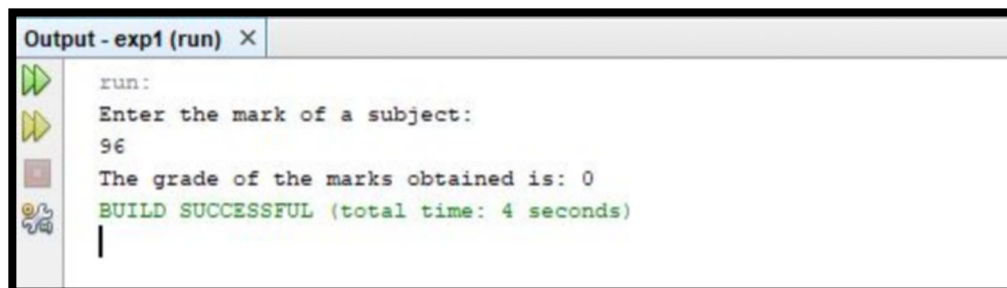
}
```

Input & Output:



The screenshot shows the 'Output - exp1 (run)' window of a Java IDE. It displays the execution of a program where the user enters '45' as the mark. The program outputs 'The grade of the marks obtained is: Fail' and reports a successful build with a total time of 6 seconds.

```
run:
Enter the mark of a subject:
45
The grade of the marks obtained is: Fail
BUILD SUCCESSFUL (total time: 6 seconds)
```



The screenshot shows the 'Output - exp1 (run)' window of a Java IDE. It displays the execution of the same program where the user enters '96' as the mark. The program outputs 'The grade of the marks obtained is: 0' and reports a successful build with a total time of 4 seconds.

```
run:
Enter the mark of a subject:
96
The grade of the marks obtained is: 0
BUILD SUCCESSFUL (total time: 4 seconds)
```

Algorithm:

3.To generate the Tribonacci series of a given number.

- 1) Start.
- 2) Read the number from user till where the Tribonacci series is to be found and store it in num.
- 3) Initialize three variables a=0, b=0, c=1, d=a + b + c.
- 4) Initialize a for loop from i=4 till i=num.
- 5) Inside the loop do the following a=b, b=c, c=d, d=a + b + c.
- 6) Display the tribonacci series.
- 7) End.

Source Code:

```
package exp1;

import java.util.Scanner;

public class tribonacci {

    public static void main(String args[]){

        Scanner s=new Scanner(System.in);

        System.out.println("Enter the number till you want to print tribonacci series: ");

        int num=s.nextInt();

        int a=0,b=0,c=1;

        int d=a + b + c;

        System.out.println("\n Tribonacci Series: ");

        System.out.print(a+ "\t" +b+ "\t" +c);

        for(int i=4; i<=num; i++){

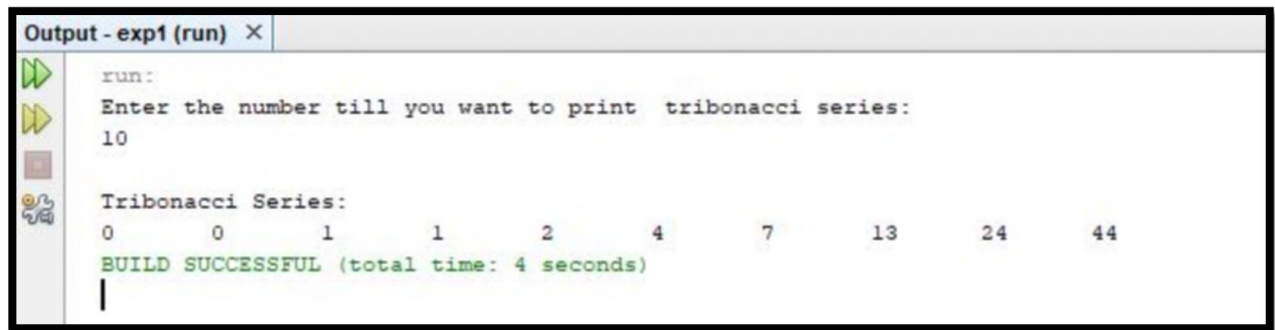
            System.out.print("\t" +d);

            a=b;
```

Java Lab Exercise

```
b=c;  
  
c=d;  
  
d=a + b + c;  
  
}  
  
System.out.println();  
  
}}
```

Input & Output:



The screenshot shows a Java IDE output window titled "Output - exp1 (run)". The window contains the following text:

```
run:  
Enter the number till you want to print tribonacci series:  
10  
  
Tribonacci Series:  
0      0      1      1      2      4      7      13      24      44  
BUILD SUCCESSFUL (total time: 4 seconds)
```

Algorithm:

4.To identify the prime numbers between given range.

- 1) Start.
- 2) Read the starting number from user till where the prime number is to be displayed.
- 3) Initialize a for loop from i=num till i=num1.
- 4) Inside the loop, initialize count=0, initialize another for loop from j=2 till j<i.
- 5) Use if loop inside the for loop to check whether i % j ==0, if it is so increment count, then break.
- 6) Then check if count==0, if it is so display the number
- 7) End.

Source Code:

```
package exp1;

import java.util.Scanner;

public class primenos {

    static public void main(String args[]){

        Scanner s=new Scanner(System.in);

        int num,num1,count=0,i,j;

        System.out.println("Enter the range between which prime numbers are to be printed: ");

        System.out.print("Enter the starting number: ");

        num=s.nextInt();

        System.out.println("");

        System.out.print("Enter the ending number: ");

        num1=s.nextInt();

        System.out.println("");

        System.out.println("The numbers between the range" +num+ " and "+num1+ " is: ");

        for(i=num; i<=num1; i++){
```

Java Lab Exercise

```
count=0;

for(j=2; j<i; j++){

    if(i % j==0){

        count++;

        break;

    }

}

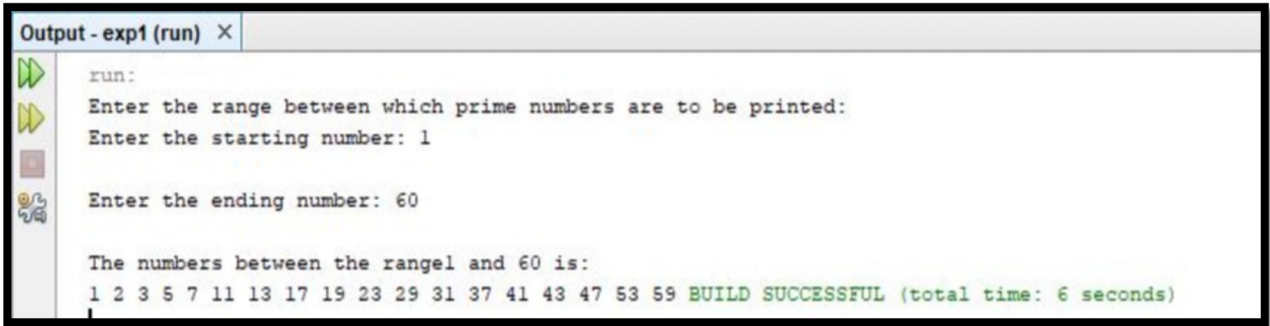
if(count==0){

    System.out.print(i+" ");

}

}
```

Input & Output:



The screenshot shows a Java IDE output window titled "Output - exp1 (run)". The output text is as follows:

```
run:
Enter the range between which prime numbers are to be printed:
Enter the starting number: 1
Enter the ending number: 60

The numbers between the rangel and 60 is:
1 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 BUILD SUCCESSFUL (total time: 6 seconds)
```


Algorithm:

5.To achieve the given pattern.

- 1) Start.
- 2) Initialize three variables for row, column and number of lines.
- 3) Initialize a for loop from i=1 till i=3 for number of rows.
- 4) Inside the loop, initialize another for loop from j=2 till j=i for the number of spaces.
- 5) Initialize another for loop to display the pattern or stars from k=1 till k = (2 * i - 1).
- 6) Display the result inside the for loop.
- 7) End.

Source Code:

```
package exp1;

public class pattern {

    public static void main(String args[]){

        int i, j, k;

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

            for(j=2; j>=i; j--){

                System.out.print(" ");

            }

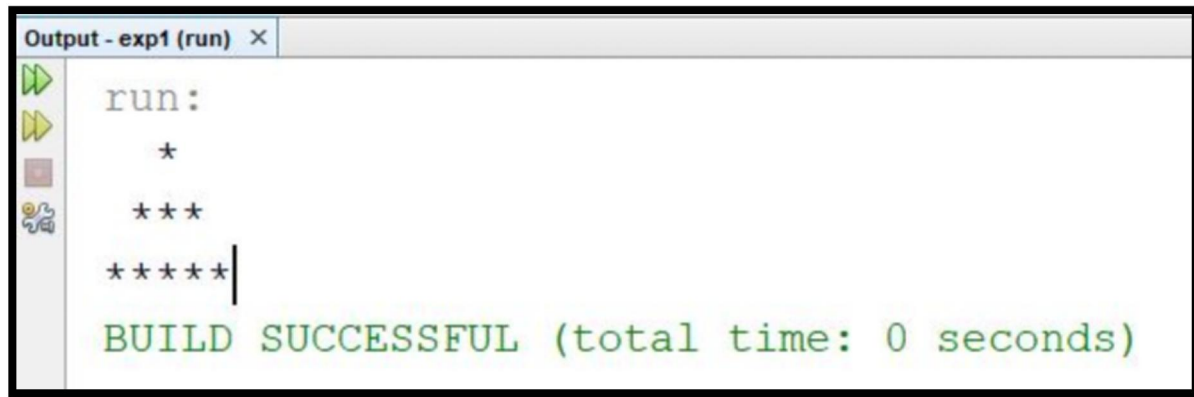
            for(k=1; k<=(2*i-1); k++){

                System.out.print("*");

            }

            System.out.println(""); } } }
```

Input & Output:



```
Output - exp1 (run) ×
run:
  *
 ***
*****
BUILD SUCCESSFUL (total time: 0 seconds)
```

Video URL:

<https://www.youtube.com/watch?v=6bZ2j8az7H8>

Result:

The program to do the given basic programs is implemented successfully and the output is verified.