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Experiment No.	1

AIM:	Programs on Encapsulation. Write a program to demonstrate classes and objects
Program 1	
PROBLEM STATEMENT:	Write a program to find all prime numbers in the given range and print them. Also, print the told no. of prime numbers. Use concept of class & Objects.

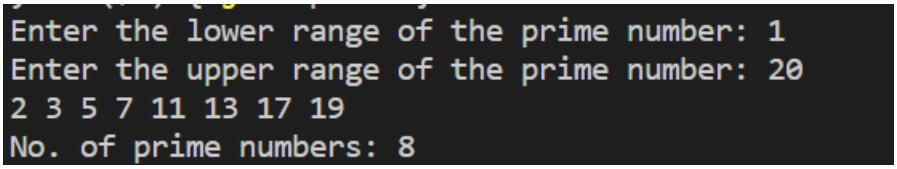
PROGRAM:	//find the prime numbers in an given range
	import java.util.*;
	
	public class prime {
	  public static int FindPrime(int n) {
	  if (n == 0 || n == 1) {
	  return 0;
	  }
	  for (int i = 2; i < n; i++) {
	  if (n % i == 0) {
	  return 0;
	  }
	  }
	  return 1;
	  }
	
	  public static void main(String[] args) {
	  prime obj = new prime();
	  Scanner scanner = new Scanner(System.in);
	  System.out.print("Enter the lower range of the prime number: ");
	  int lower = scanner.nextInt();
	  System.out.print("Enter the upper range of the prime number: ");
	  int upper = scanner.nextInt();
	  int count = 0;
	  for (int i = lower; i <= upper; i++) {
	  if (obj.FindPrime(i) == 1) {
	  System.out.print(i + " ");
	  count++;

```
        }

      }
      System.out.println("\nNo. of prime numbers: " + count);

   }
}
```

RESULT:



Program 2

PROBLEM STATEMENT:

A Mersenne prime is a prime number that has the form 2^p-1 where p is a positive number greater than 1. Write a program that calculates candidate Mersenne primes $2^p - 1$ for $2 \leq p \leq 31$. Then test the number to see if it is prime. If you detect that the number is prime, print out the number and the value of p.

PROGRAM:

```
import java.util. *;
import java.lang.Math;
public class MPrime {
   public int CheckPrime(double n) {
      if (n==0 || n==1) {
         return 0;
      }
      for (int i=2;i<=Math.sqrt(n);i++) {
         if (n%i==0) {
            return 0;
         }
      }
      System.out.print((int)n+" ");
      return 1;
   }
   public static void main(String[] args) {
      MerPrime obj = new MerPrime();
      double a;
      for(int i=2;i<=31;i++) {
```

```
            a = Math.pow(2.0,(double)i)-1.0;
            obj.CheckPrime(a);
        }
    }
}
```

RESULT:

```
 ; if ($?) { java MPrime }
3 7 31 127 8191 131071 524287 2147483647
```

Program 3

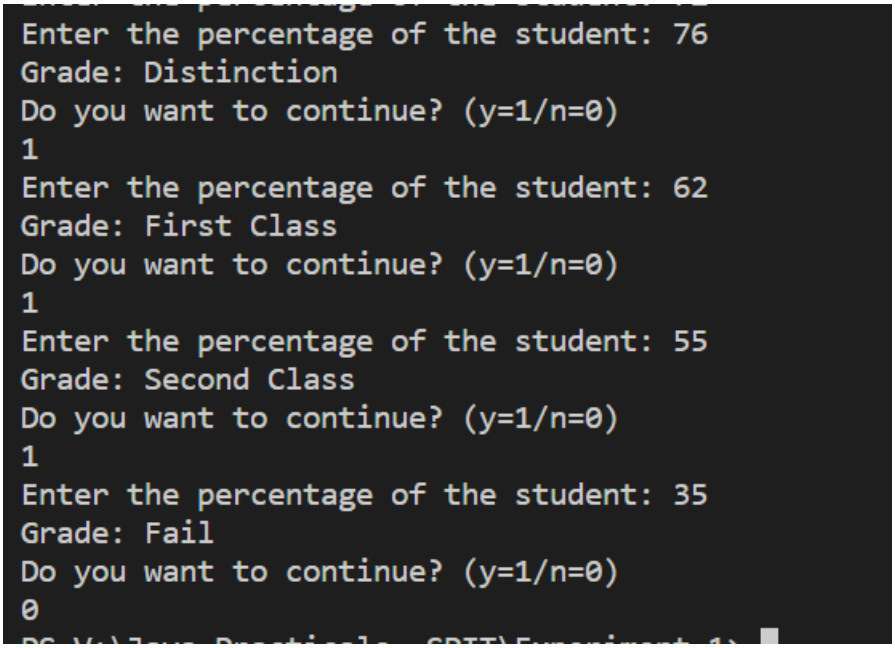
PROBLEM STATEMENT:

To write a java program to print grade of the student
1. 75% and above - Distinction
2. 60% to 74% - first class
3. 45% to 59% - second class
4. below 44% - fail class

PROGRAM:

```
import java.util.*;
public class grade
{
public static void main(String[] args) {
   int grade;
   Scanner scanner= new Scanner(System.in);
        do{
            System.out.print("Enter the percentage of the student: ");
            int perc = scanner.nextInt();
            if(perc>=75) {
                System.out.println("Grade: Distinction");
            } else if(perc>=60) {
                System.out.println("Grade: First Class");
            } else if(perc>=45) {
                System.out.println("Grade: Second Class");
            } else {
                System.out.println("Grade: Fail");
            }
            System.out.println("Do you want to continue? (y=1/n=0)");
        }while(scanner.nextInt()!=0);
    }
}
```

RESULT:



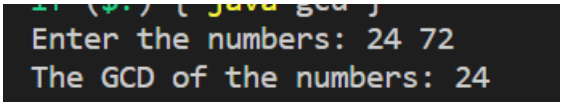
Program 4	
PROBLEM STATEMENT:	Find GCD of Two Numbers Using for Loop

PROGRAM:	import java.util.*;
	public class gcd{
	public static void main(String[] args) {
	int grade;
	System.out.print("Enter the numbers: ");
	Scanner scanner= new Scanner(System.in);
	int a= scanner.nextInt();
	int b= scanner.nextInt();
	int i;
	int gcd=1;//prime no. ka gcd=1
	if(a>b)
	{
	for(i=2;i<=b;i++)
	{
	if(a%i==0 && b%i==0)
	{
	gcd=i;
	
	}
	}
	}
	else if(b>a)

```
    {
        for(i=2;i<=b;i++)
       {
          if(a%i==0 && b%i==0)
          {
             gcd=i;

          }
    }
    }
    System.out.println("The GCD of the numbers: " +gcd);
  }
}
```

RESULT:



CONCLUSION:	In this experiment, we learned about the basic programs in java by using control flow statements and loops.