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| **Experiment No.** | **1** |

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| **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:** | import *java*.*util*. *\**;  import *java*.*lang*.*Math*;  *public* *class* Prime {  *public* int CheckPrime(int n) {          if (n==0 || n==1) {              return 0;          }          for (int i=2;i<=Math.sqrt(n);i++) {              if (n%i==0) {                  return 0;              }          }          return 1;      }  *public* *static* void main(String[] args) {          Scanner input = new Scanner(System.*in*);          Prime obj = new Prime();          System.*out*.println("Enter the lower range: ");          int lower = input.nextInt();          System.*out*.println("Enter the upper range: ");          int upper = input.nextInt();          int count = 0;          for (int i=lower;i<=upper;i++) {              if (obj.CheckPrime(i)==1) {                  System.*out*.print(i+" ");                  count++;              }          }          System.*out*.println("\nTotal prime numbers are: " + count);      }  } |
| **RESULT:** | |
| **Program 2** | |
| **PROBLEM STATEMENT:** | A Mersenne prime is a prime number that has the form 2p−1 where p is a positive number greater than 1. Write a program that calculates candidate Mersenne primes 2p − 1 for 2≤p≤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* MerPrime {  *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:** | |
| **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) {          Scanner input = new Scanner(System.*in*);          do{              System.*out*.println("Enter the percentage of the student: ");              int perc = input.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(input.nextInt()!=0);      }  } |
| **RESULT:** | |
| **Program 4** | |
| **PROBLEM STATEMENT:** | 4.  Find GCD of Two Numbers Using for Loop |
| **PROGRAM:** | import *java*.*util*. *\**;  import *java*.*lang*.*Math*;  *public* *class* Gcd {  *public* *static* int gcd(int a, int b) {          if(b==0)              return a;          else if(a==0)              return b;          if(a>b)              return gcd(a-b, b);          else              return gcd(b-a, a);      }  *public* *static* void main(String[] args) {          Scanner input = new Scanner(System.*in*);          int a,b;          do{              System.*out*.println("Enter the first number: ");              a = input.nextInt();              System.*out*.println("Enter the second number: ");              b = input.nextInt();              System.*out*.println("GCD of "+a+" and "+b+" is "+gcd(a,b));              System.*out*.println("Do you want to continue? (y=1/n=0)");          }while(input.nextInt()!=0);      }  } |
| **RESULT:** | |
| **CONCLUSION:** | In this experiment, we learned how to write basic programs in java by using control flow statements and loops. |