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Section: B

Department of Electrical Engineering

Programming Fundamentals LAB

OPEN ENDED LAB

Programming Fundamentals Lab (EE-112L) (Openness Level-1)

Total Marks = 13

Open Ended Task

Design and implement algorithm to check and list prime numbers using C Programming Language. Your Submission should include but is not limited to

1. General description of a Prime number and method of generating/checking one

ANSWER:-

General description of a Prime number:-

A prime number is **a whole number greater than 1 whose only factors are 1 and itself**. A factor is a whole number that can be divided evenly into another number. The first few prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29. Numbers that have more than two factors are called composite numbers.

Some facts:

- The only even prime number is 2. All other even numbers can be divided by 2.
- If the sum of a number's digits is a multiple of 3, that number can be divided by 3.
- No prime number greater than 5 ends in a 5. Any number greater than 5 that ends in a 5 can be divided by 5.
- Zero and 1 are not considered prime numbers.
- Except for 0 and 1, a number is either a prime number or a composite number. A composite number is defined as any number, greater than 1, that is not prime.

METHOD OF GENERATING/CHECKING:-

To prove whether a number is a prime number, first try dividing it by 2, and see if you get a whole number. If you do, it can't be a prime number. If you don't get a whole number, next try dividing it by prime numbers: 3, 5, 7, 11 (9 is divisible by 3) and so on, always dividing by a prime number

2. C Program for checking if a given number that is entered by the user is prime or not.

ANSWER:-

CODE:-

```
#include<stdio.h>

void main()

{

    /*Programmer Name:Muhammad Saad

      Reg.No:20MDELE163

      Date:21/07/2021

    */

    printf("Programmer:Muhammad Saad\nReg.No:20MDELE163\n");

    printf("*****************************************************************\n");

    printf("PROGRAM FOR FINDING THE ENTERED NUMBER IS A PRIME NUMBER OR NOT\n");

    printf("*****************************************************************\n");

    int num,i;

    printf("Please Enter a number:");

    scanf("%d",&num);

    for(i=2;i<num;i++)

   {


            if(num%i==0)
```

```
            {
                        printf("%d is not Prime Number\n",num);
                        break;
                }
        }
        if(i==num)
        printf("%d is a Prime Number",num);
    }
```

3. C Program that saves all the prime numbers in a fixed interval of time on PC

ANSWER:- I use a for loop for showing all the prime numbers between 50 and 150.

CODE:-

```
#include<stdio.h>
void main()
{
        /*
        Programmer Name:Muhammad Saad
        Reg.No.:20MDELE163
        Date:22/07/2021
        */
        printf("Programmer Name:Muhammad Saad\nReg.No.:20MDELE163\n\n");
        int i,j;                    //declare i and j
        for(i=50;i<=150;i++)        //using for_loop
        {
```

```
            for(j=2;j<=i;j++)       //using for_loop
            {
                    if(i%j==0)      //using if_statement
                    {
                            break;      //using 'break' statement
                    }           //End of 'break' statement
            }               //End of internal_block
        if(i==j)        //using if_statement
         {
              printf("%d is prime number.\n",i);   //Display Prime Numbers
           }                        //End of printf block

   }        //End of External block
}           ////End of main_block
```

4. Screenshot of the working of the programs developed in part 2 and 3

ANSWER:-

PART:2

Program:-

```c
#include<stdio.h>
void main()
{
    /*Programmer Name:Muhammad Saad
      Reg.No:20MDELE163
      Date:21/07/2021
    */
    printf("Programmer:Muhammad Saad\nReg.No:20MDELE163\n");
    printf("*****************************************************************\n");
    printf("PROGRAM FOR FINDING THE ENTERED NUMBER IS A PRIME NUMBER OR NOT\n");
    printf("*****************************************************************\n");
    int num,i;
    printf("Please Enter a number:");
    scanf("%d",&num);
    for(i=2;i<num;i++)
    {

        if(num%i==0)
        {
            printf("%d is not Prime Number\n",num);
            break;
        }
    }
    if(i==num)
    printf("%d is a Prime Number",num);
}


```

OUTPUT:-

```
Programmer:Muhammad Saad
Reg.No:20MDELE163
*****************************************************************
PROGRAM FOR FINDING THE ENTERED NUMBER IS A PRIME NUMBER OR NOT
*****************************************************************
Please Enter a number:5
5 is a Prime Number
--------------------------------
Process exited after 4.195 seconds with return value 19
Press any key to continue . . .
```

PART:3

Program:-

```c
#include<stdio.h>
void main()
{
    /*
    Programmer Name:Muhammad Saad
    Reg.No.:20MDELE163
    Date:22/07/2021
    */
    printf("Programmer Name:Muhammad Saad\nReg.No.:20MDELE163\n\n");
    int i,j;                          //declare i and j
    for(i=50;i<=150;i++)             //using for_loop
    {
        for(j=2;j<=i;j++)           //using for_loop
        {
            if(i%j==0)             //using if_statement
            {
                break;            //using 'break' statement
            }                    //End of 'break' statement
        }                       //End of internal_block
        if(i==j)               //using if_statement
          {
            printf("%d is prime number.\n",i);   //Display Prime Numbers
          }                                      //End of printf block

    }          //End of External block
}             ////End of main_block
```

OUTPUT:-

```
Programmer Name:Muhammad Saad
Reg.No.:20MDELE163

53 is prime number.
59 is prime number.
61 is prime number.
67 is prime number.
71 is prime number.
73 is prime number.
79 is prime number.
83 is prime number.
89 is prime number.
97 is prime number.
101 is prime number.
103 is prime number.
107 is prime number.
109 is prime number.
113 is prime number.
127 is prime number.
131 is prime number.
137 is prime number.
139 is prime number.
149 is prime number.

--------------------------------
Process exited after 0.01658 seconds with return value 150
Press any key to continue . . .
```

5. Your interpretation and explanation of the obtained results in 3 and write down ways of improving it.

ANSWER:-

In part 2, I make such type of program which can display the entered number behavior such that it is a prime number or not. It is unable to display anything more.

But Part 3, I make such type of program that can display all prime number between the given values in the program. In program I display the prime number between 50 to 150 which is better than part 2.

I use two for loop, two if statement and one break statement for improving part 2 into part 3

Registration No.: 20MDELE163

Class: 2nd Semester

Section: B

Total Marks Obtained:

THE END