C Program to Find Prime Number

In this tutorial, we will write a program to find the prime number in C language. A prime number is defined as a natural number greater than 1, which has no other factors except 1 and itself. Such a number is called a prime number. To check that number is a prime number or not we multiply all the pair so smaller number than that number to see if that number has any other factor except 1, which means that we have to do (n-1) operations.

But this logic is considered wrong to implement because we are doing the extra operation in it. For example, if we have to check the “36” number prime or not. If we apply the logic to multiply all the numbers till (n-1) then we will be perform the same operation for to same values such as: 4 x 9 = 36 and 9 x 4 = 36. So these are extra operations which can be done only once. To minimize these operations we will iterate the loop till the root of the number.

An example program is shown below

```
#include<stdio.h>

int main(){
    int n = 7;
    int isPrime = 1;
    for (int i = 2; i*i < n; i++)
    {
        if(n%i==0){
```

```
            isPrime = 0;
        }
    }
    if(isPrime){
        printf("The number %d is prime\n", n);
    }
    else{
        printf("The number %d is not prime\n", n);
    }

    return 0;
}
```

Code Snippet 1: C Program to Find Prime Number

As shown in a code snippet 1,

1. We have initialized an integer variable “n” which has value “7” this program will check if the number “7” is prime or not.
2. We have initialized an integer variable “isprime” which has value “1”
3. The “for” loop will start from “2” and iterate till the root of the variable “n” and the “if” condition will take a modulus of the variables “n” and “i” and check that the values is equal to “0” or not. If the value is equal to “0” then it will set the value of the variable “isprime” to “0”. If the value is not equal to “0” then it will do nothing.
4. When the “for” loop terminates the value of the “isprime” will be checked by the “if” condition outside the “for” loop. If the value of “isprime” will be “1” the “if” condition will get true it will run the “printf” function and print “The number %d is prime”, the “%d” will be changed by the value of the variable “n”
5. But If the value of “isprime” will be “0” the “if” condition will get false and else condition will run the “printf” function and print “The number %d is not prime”, the “%d” will be changed by the value of the variable “n”

The output of the following program is shown below

```
The number 7 is prime
```

Figure 1: Program Output

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