

Functions (Part 1 Basics)

LAB # 06



Spring 2022

CSE-102L COMPUTER PROGRAMMING LAB

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Section: C

"On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

Student Signature: _____

Submitted to:

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(July 2022)

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Lab 6: Functions (Part 1 Basics)

Objectives:

To understand function programming, its types and function-call.

Tasks:

Note: Implement all the tasks using functions.

1. Write a program that takes marks and registration number as input and then displays your name, grade and registration number using function. (You must use your own name and registration number also the grade must be calculated on the bases of marks).
2. Write a function minmax () that takes four integers as input and display the minimum and maximum number.
3. Your program should have a function named 'prime' which accepts an integer and return a Boolean (a true if the number is prime and false otherwise). Return type bool function
4. Write a program to find a factorial of user input number. Use function to find factorial.
5. Write a program to find the roots of a quadratic equation of type $a.x^2+b.x+c$ where the value of a, b, c is to be entered by the user inside main() and the values must be stored inside an array called values. make sure value of a must be non-zero if it is complete the program. There must be two function one called roots() the other called deter(). First main() will send the array values to deter to calculate d and then send the calculated d to roots() .

Algorithm for function deter():

- a. Read the coefficients of a quadratic equation a, b, c
- b. Calculate determinant $d = b*b - 4*a*c$
- c. Return d value to main()

Algorithm for function roots():

- d. roots() will receive value of d from main() and then calculate and display the following
- e. If $d > 0$ calculate two real roots $r1 = (-b + \sqrt{d}) / (2*a)$ and $r2 = (-b - \sqrt{d}) / (2*a)$
- f. If $d=0$, then roots r1 and r2 are equal and display $r1 = r2 = -b/(2*a)$
- g. If $d < 0$ then roots are imaginary and display real root $= -b/(2*a)$ and img root $= \sqrt{-d}/(2*a)$

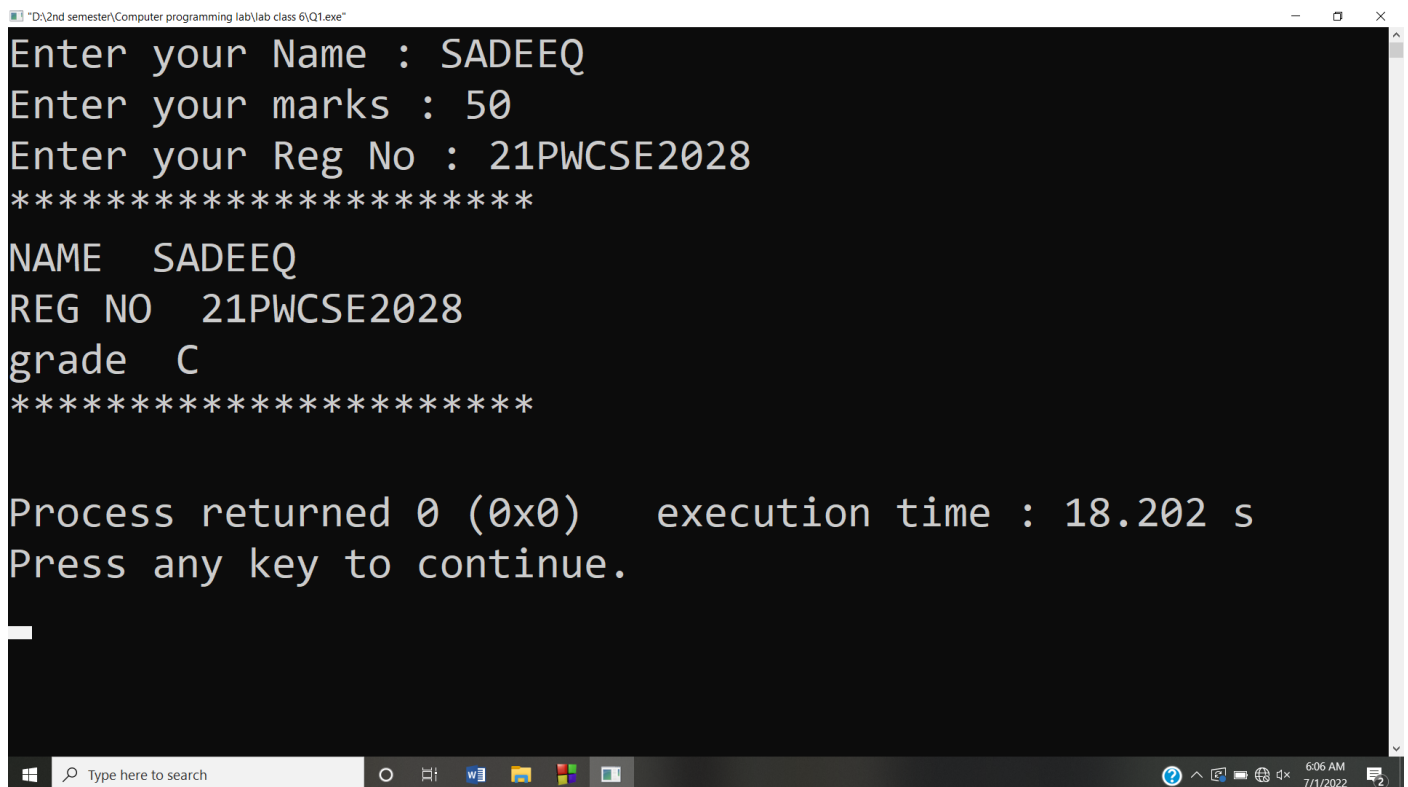
Hint: deter() is return type and roots() is non-return type. The array which will have the values of a, b ,c should be declared globally (before main()) so that it could be accessed by all functions.

COMPUTER PROGRAMMING LAB # 6**Answer #1****CODE:**

```
*Q1.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Start here x *Q1.cpp x
1  #include <iostream>
2
3  using namespace std;
4
5  void fun(string name, char grade, string reg) {
6
7
8      cout<<"*****\n";
9      cout<<"NAME  "<<name<<endl;
10     cout<<"REG NO  "<<reg<<endl;
11     cout<<"grade  "<<grade<<endl;
12     cout<<"*****\n";
13
14 int main() {
15     char grade;
16     int marks;
17     string reg, name;
18     cout<<"Enter your Name : ";
19     getline(cin, name);
20     cout<<"Enter your marks : ";
21     cin>>marks;
22     cout<<"Enter your Reg No : ";
23     cin>>reg;
```

```
*Q1.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Start here x *Q1.cpp x
15     char grade;
16     int marks;
17     string reg, name;
18     cout<<"Enter your Name : ";
19     getline(cin, name);
20     cout<<"Enter your marks : ";
21     cin>>marks;
22     cout<<"Enter your Reg No : ";
23     cin>>reg;
24
25     if(marks>=20&&40>marks){
26         grade='D';
27     }
28     if(marks>=40&&60>marks){
29         grade='C';
30     }
31     if(marks>=60&&80>marks){
32         grade='B';
33     }
34     if(marks>=80&&100>marks){
35         grade='A';
36     }
37
38     fun(name, grade, reg);
39     return 0;
```

OUTPUT:



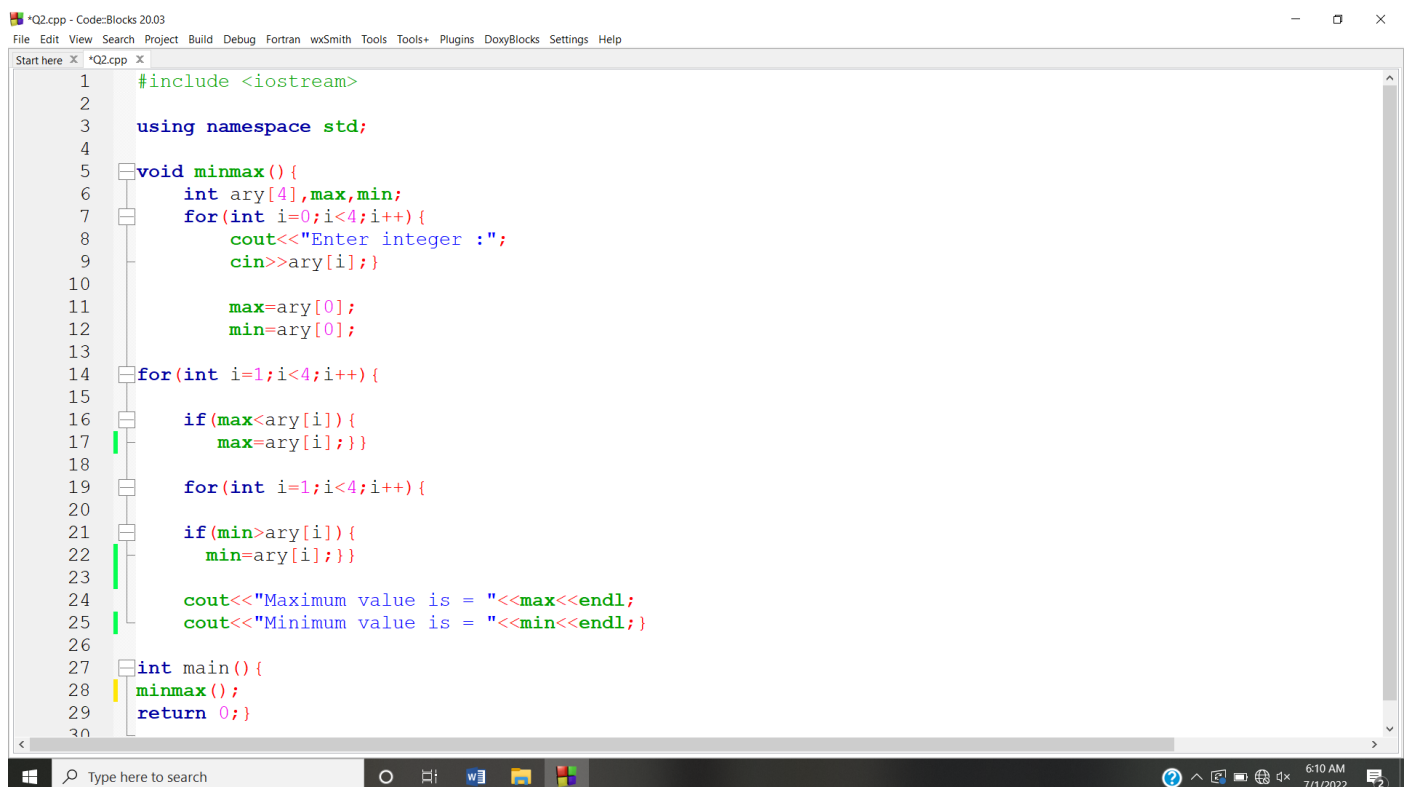
```
"D:\2nd semester\Computer programming lab\lab class 6\Q1.exe"

Enter your Name : SADEEQ
Enter your marks : 50
Enter your Reg No : 21PWCSE2028
*****
NAME  SADEEQ
REG NO  21PWCSE2028
grade  C
*****

Process returned 0 (0x0)   execution time : 18.202 s
Press any key to continue.
```

Answer #2

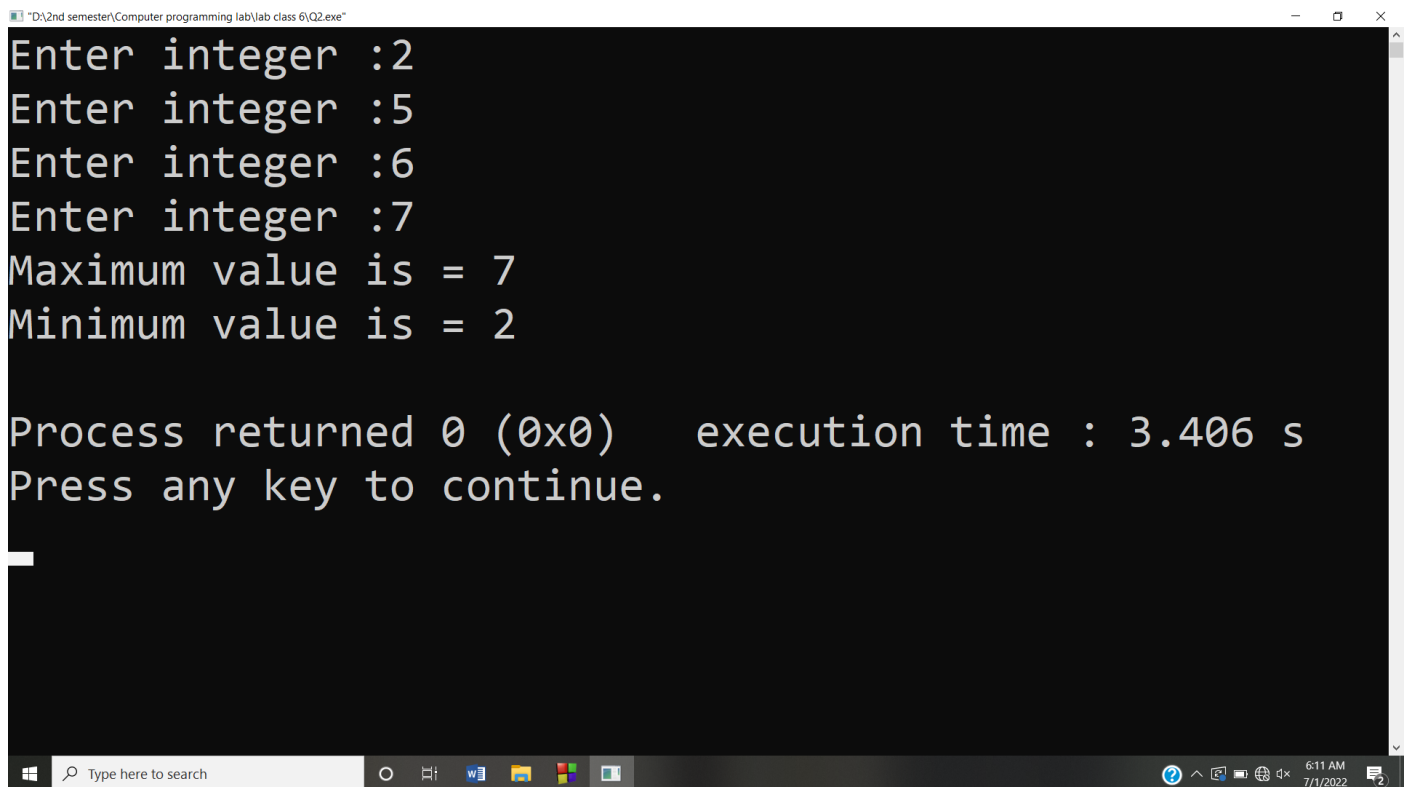
CODE:



```
*Q2.cpp - Code::Blocks 20.03
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Start here x *Q2.cpp x
1  #include <iostream>
2
3  using namespace std;
4
5  void minmax(){
6      int ary[4],max,min;
7      for(int i=0;i<4;i++){
8          cout<<"Enter integer :";
9          cin>>ary[i];}
10
11      max=ary[0];
12      min=ary[0];
13
14      for(int i=1;i<4;i++){
15
16          if(max<ary[i]){
17              max=ary[i];}
18
19          for(int i=1;i<4;i++){
20
21              if(min>ary[i]){
22                  min=ary[i];}
23
24              cout<<"Maximum value is = "<<max<<endl;
25              cout<<"Minimum value is = "<<min<<endl;}
26
27      int main(){
28          minmax();
29          return 0;}
30
```

OUTPUT:

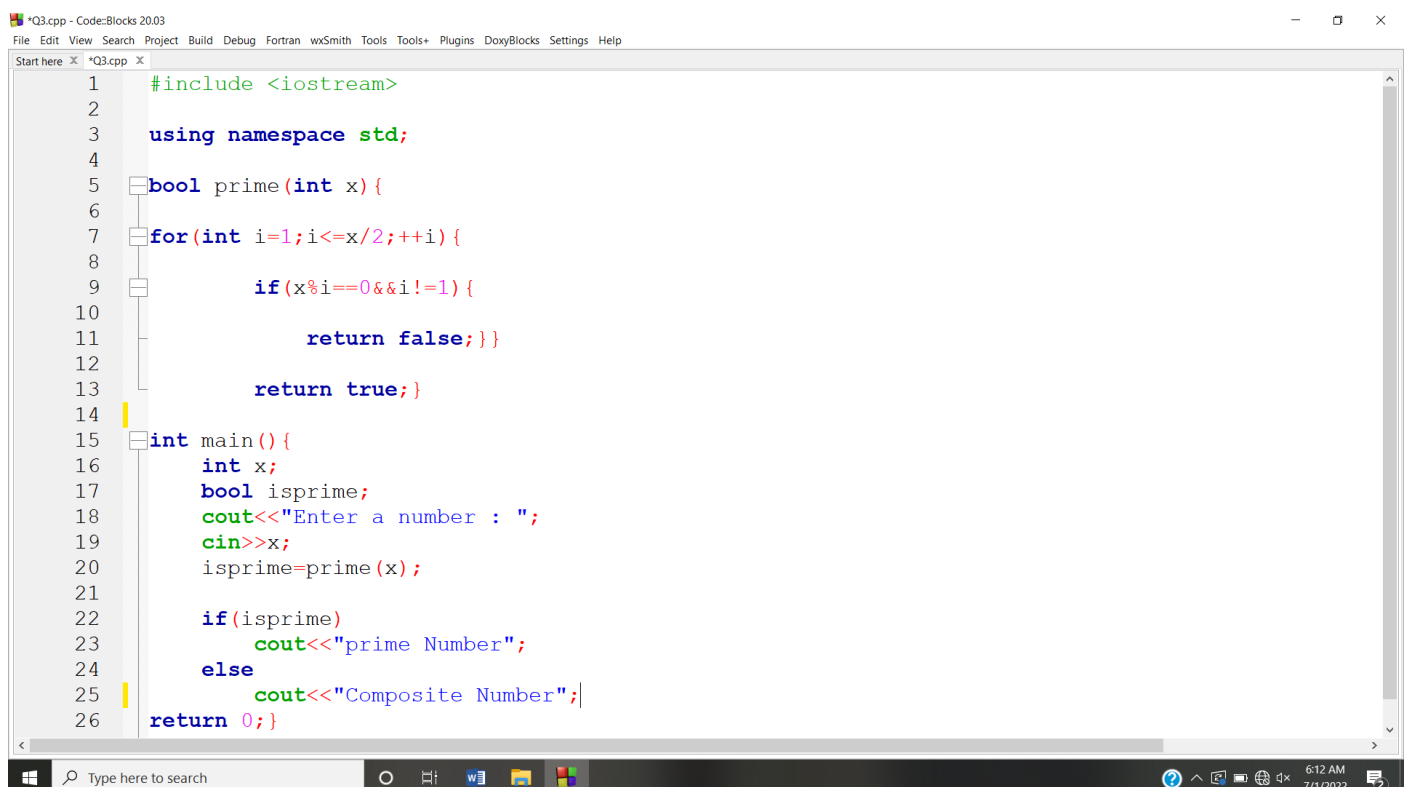


```
"D:\2nd semester\Computer programming lab\lab class 6\Q2.exe"
Enter integer :2
Enter integer :5
Enter integer :6
Enter integer :7
Maximum value is = 7
Minimum value is = 2

Process returned 0 (0x0)   execution time : 3.406 s
Press any key to continue.
```

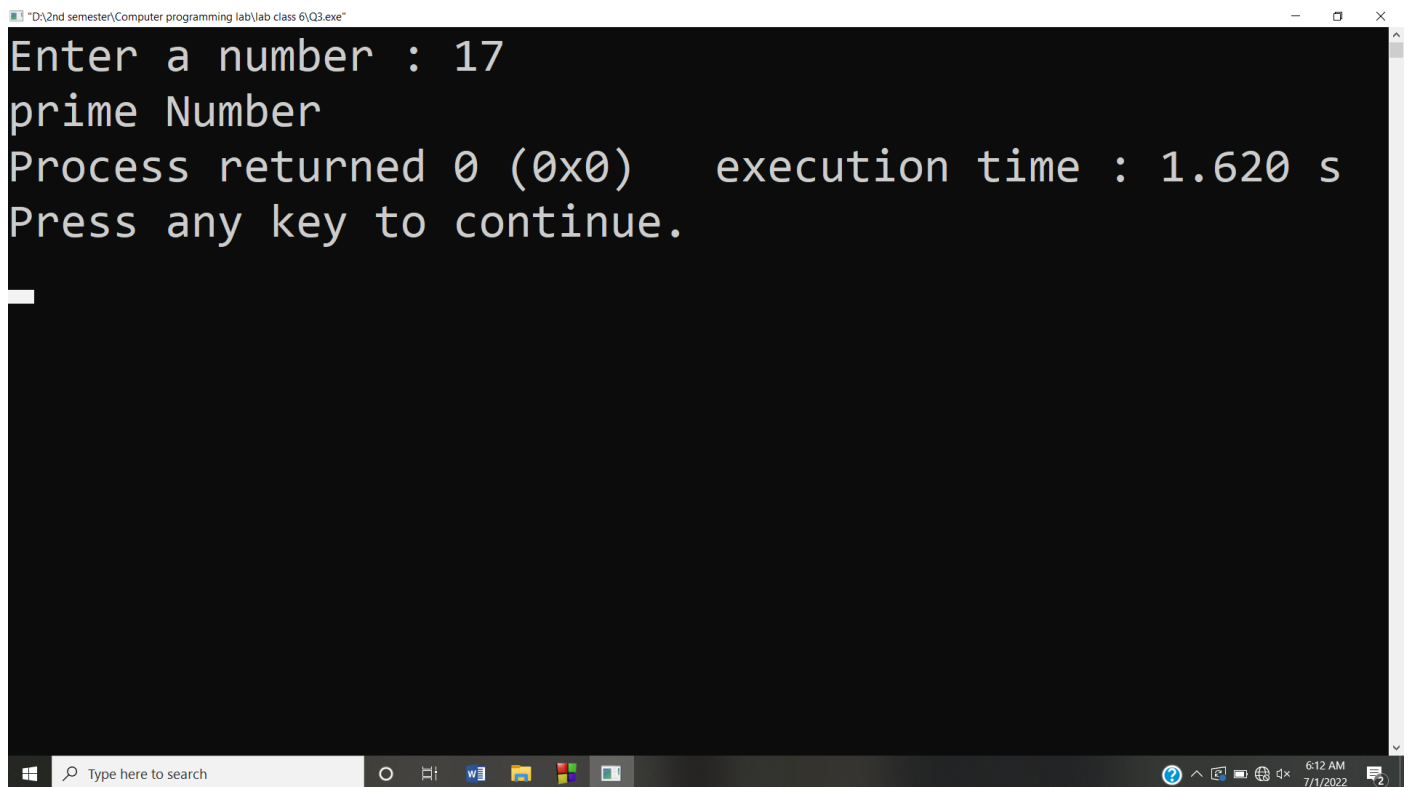
Answer #3

CODE:



```
*Q3.cpp - Code::Blocks 20.03
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Start here x *Q3.cpp x
1  #include <iostream>
2
3  using namespace std;
4
5  bool prime(int x){
6
7  for(int i=1;i<=x/2;++i){
8
9      if(x%i==0&&i!=1){
10
11          return false;}}
12
13      return true;}
14
15  int main(){
16      int x;
17      bool isprime;
18      cout<<"Enter a number : ";
19      cin>>x;
20      isprime=prime(x);
21
22      if(isprime)
23          cout<<"prime Number";
24      else
25          cout<<"Composite Number";
26      return 0;}
```

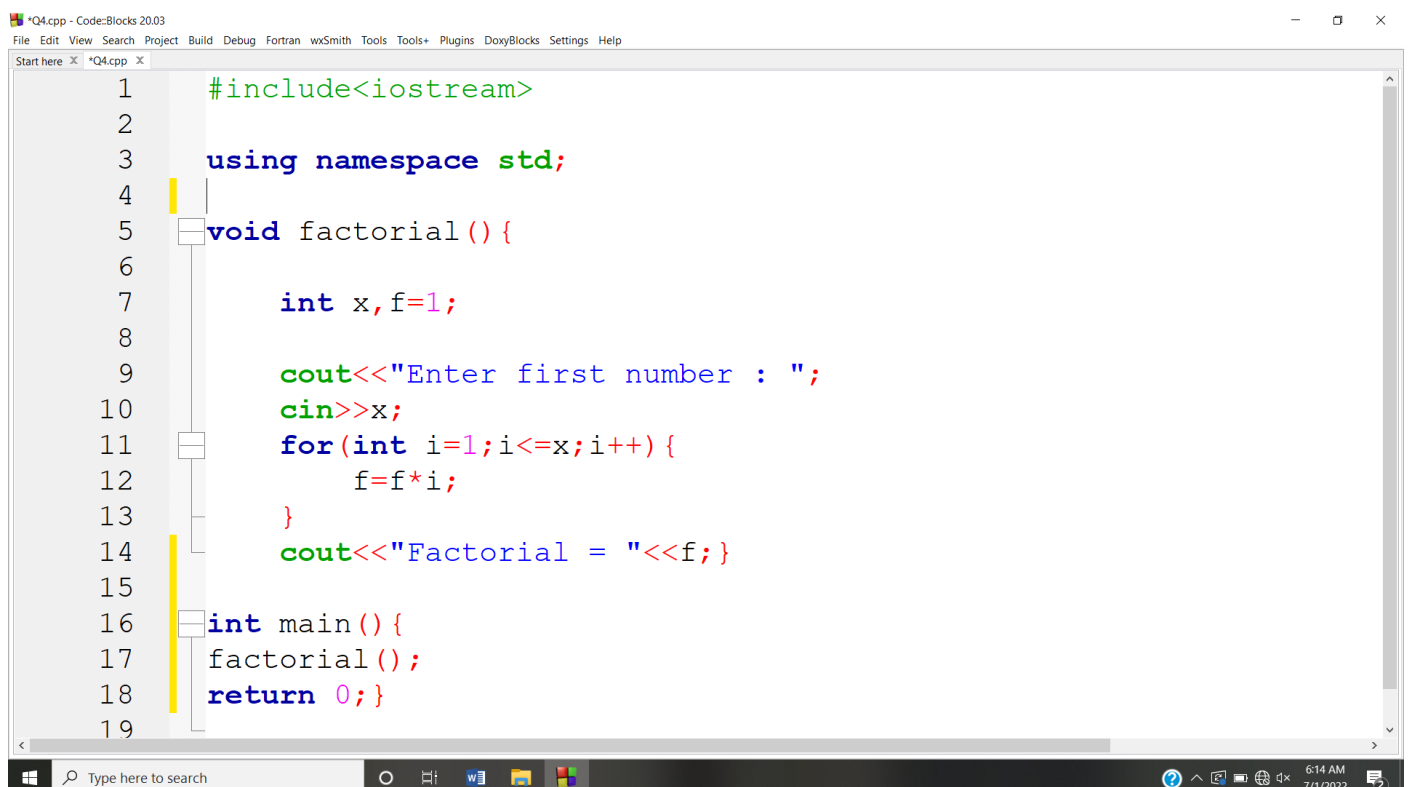
OUTPUT:



```
Enter a number : 17
prime Number
Process returned 0 (0x0) execution time : 1.620 s
Press any key to continue.
```

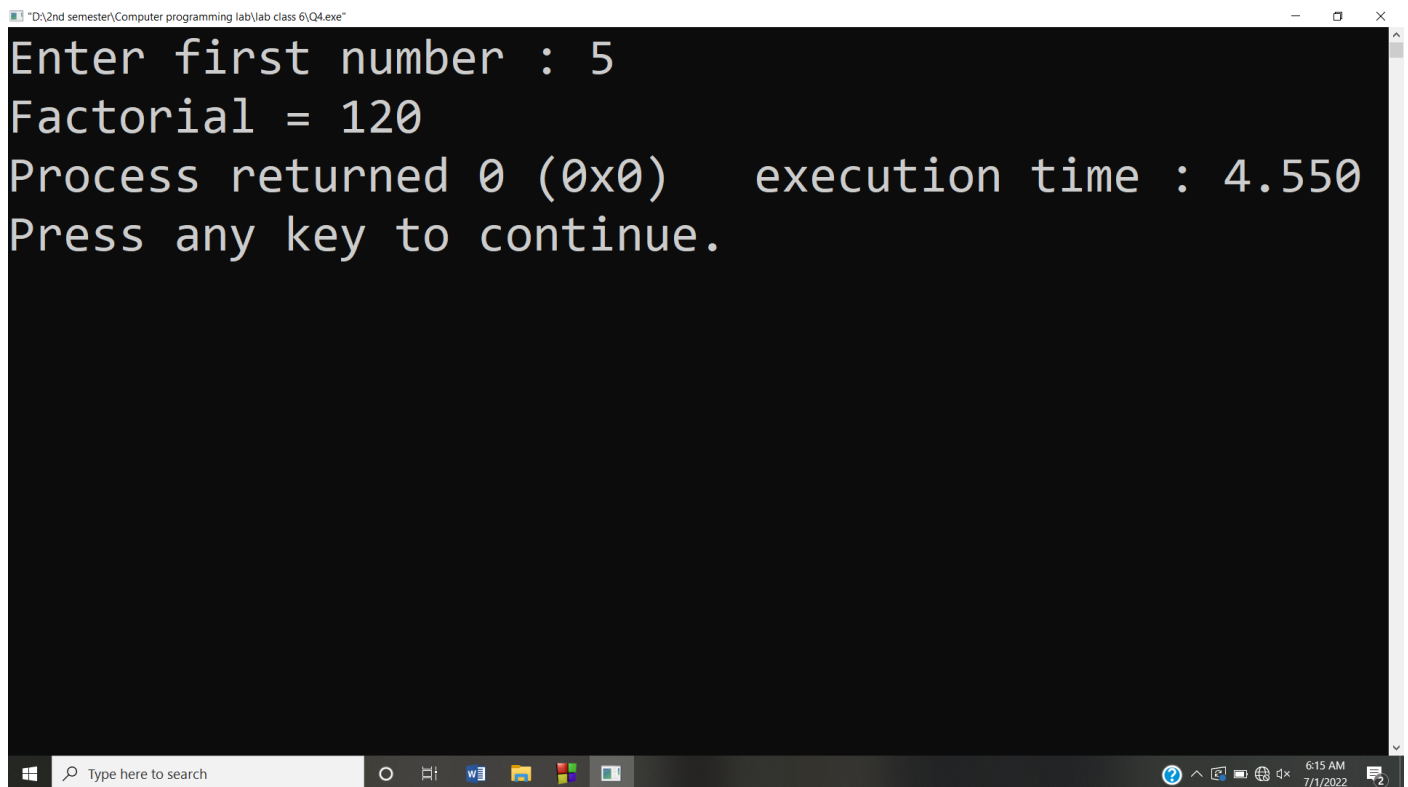
Answer #4

CODE:



```
*Q4.cpp - Code::Blocks 20.03
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Start here x *Q4.cpp x
1      #include<iostream>
2
3      using namespace std;
4
5      void factorial(){
6
7          int x,f=1;
8
9          cout<<"Enter first number : ";
10         cin>>x;
11         for(int i=1;i<=x;i++){
12             f=f*i;
13         }
14         cout<<"Factorial = "<<f;}
15
16     int main(){
17         factorial();
18         return 0;}
19
```

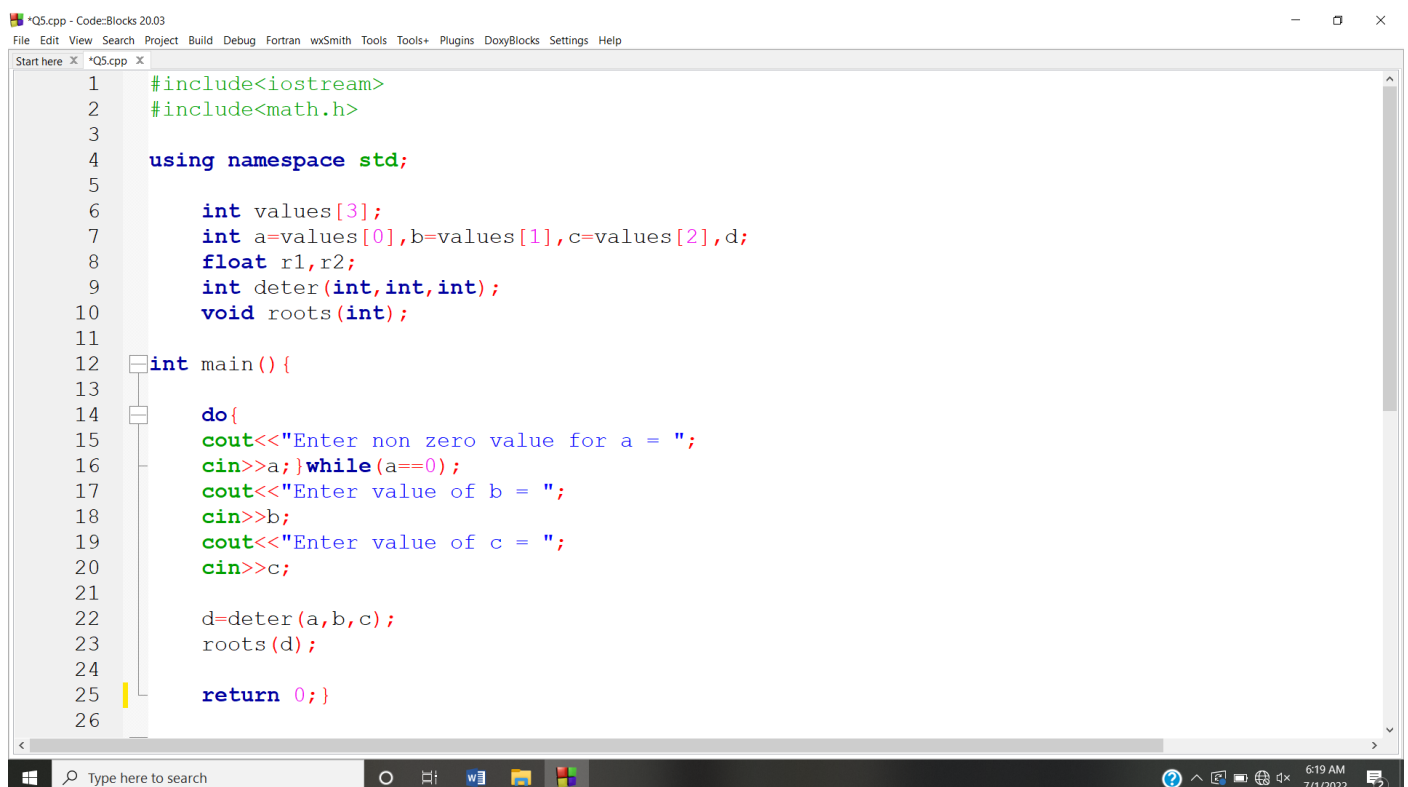
OUTPUT:



```
Enter first number : 5
Factorial = 120
Process returned 0 (0x0) execution time : 4.550
Press any key to continue.
```

Answer #5

CODE:



```
*Q5.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Start here x *Q5.cpp x
1 #include<iostream>
2 #include<math.h>
3
4 using namespace std;
5
6 int values[3];
7 int a=values[0],b=values[1],c=values[2],d;
8 float r1,r2;
9 int deter(int,int,int);
10 void roots(int);
11
12 int main() {
13
14     do{
15         cout<<"Enter non zero value for a = ";
16         cin>>a; } while (a==0);
17         cout<<"Enter value of b = ";
18         cin>>b;
19         cout<<"Enter value of c = ";
20         cin>>c;
21
22         d=deter(a,b,c);
23         roots(d);
24
25         return 0; }
26
```

```
26
27 void roots(int){
28
29     cout<<"\nDiscriminant = "<<d<<endl;
30
31     if(d>0){
32         r1 = (-b + sqrt(d)) / (2*a);
33         cout<<"\nFirst root = "<<r1<<endl;
34         r2 = (-b - sqrt(d)) / (2*a);
35         cout<<"\nSecond root = "<<r2<<endl;
36
37     else if(d==0){
38         r1 = r2 = -b/(2*a);
39         cout<<"\nBoth roots are equal = "<<r1<<endl;
40
41     else if(d<0){
42         r1=-b/(2*a);
43         r2=sqrt(-d)/(2*a);
44         cout<<"\nFirst root = "<<r1<<endl;
45         cout<<"\nSecond root = "<<r2<<endl;
46
47 int deter(int a,int b,int c){
48     int d=b*b-4*a*c;
49     return d;
50
51
```

OUTPUT:

```
"D:\2nd semester\Computer programming lab\lab class 6\Q5.exe"
Enter non zero value for a = 6
Enter value of b = 12
Enter value of c = 2

Discriminant = 96

First root = -0.183503

Second root = -1.8165

Process returned 0 (0x0)    execution time : 2.848 s
Press any key to continue.
```