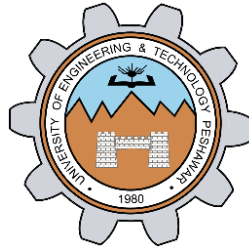


**POINTERS (PART 2 POINTERS WITH
ARRAYS AND FUNCTIONS
LAB # 9**



**Spring 2022
CSE102L Computer Programming Lab**

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Registration No. : **21PWCSE2059**

Class 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:

Engr. Abdullah Hamid

July 4, 2022

Department of Computer Systems Engineering
University of Engineering and Technology, Peshawar

Lab Objective(s)

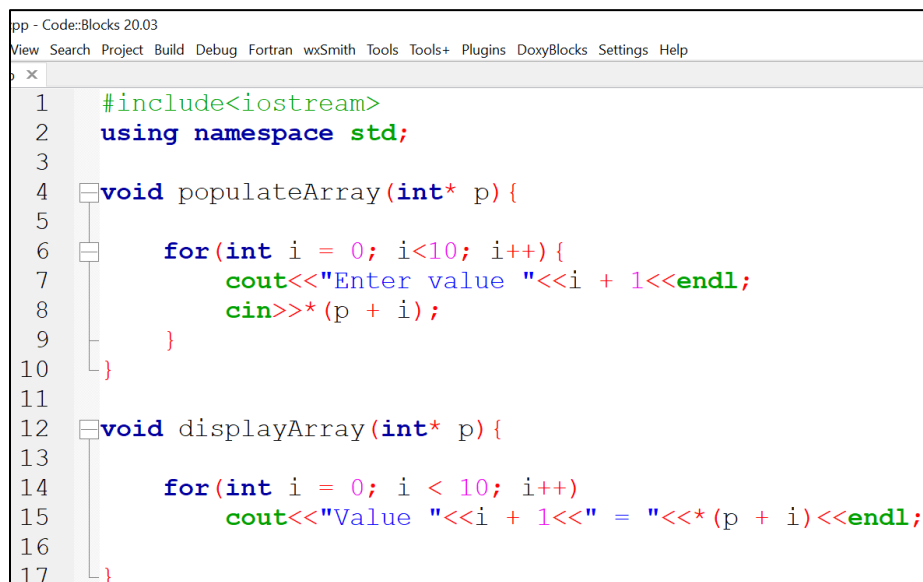
- To understand pointer role in arrays and functions

TASK # 1:**Title:**

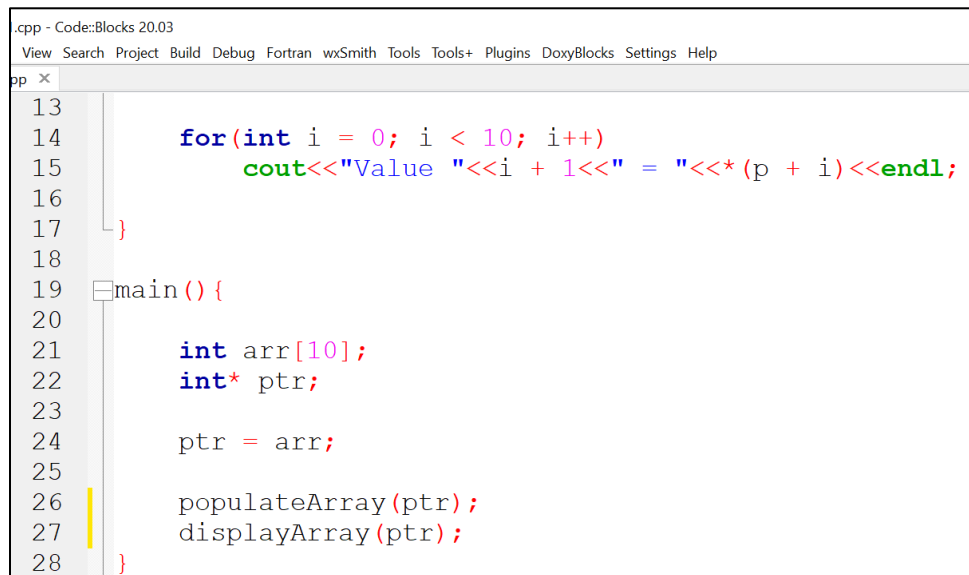
Write a C++ program.....and displaying the values must be done using a single pointer

CODE SCREENSHOTS:

Here are the screenshots of the code.



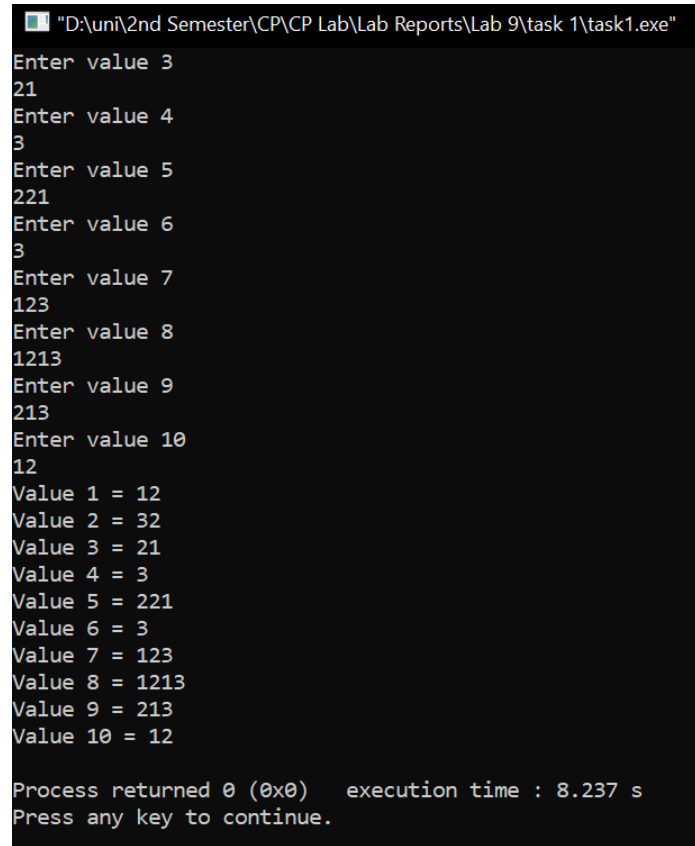
```
pp - Code::Blocks 20.03
View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
1  #include<iostream>
2  using namespace std;
3
4  void populateArray(int* p){
5
6      for(int i = 0; i<10; i++){
7          cout<<"Enter value "<<i + 1<<endl;
8          cin>>*(p + i);
9      }
10 }
11
12 void displayArray(int* p){
13
14     for(int i = 0; i < 10; i++)
15         cout<<"Value "<<i + 1<<" = "<<*(p + i)<<endl;
16
17 }
```



```
.cpp - Code::Blocks 20.03
View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
13
14     for(int i = 0; i < 10; i++)
15         cout<<"Value "<<i + 1<<" = "<<*(p + i)<<endl;
16
17 }
18
19 main(){
20
21     int arr[10];
22     int* ptr;
23
24     ptr = arr;
25
26     populateArray(ptr);
27     displayArray(ptr);
28 }
```

OUTPUT (COMPILATION, DEBUGGING & TESTING):

Here is the screenshot of the output of above code.



```
"D:\uni\2nd Semester\CP\CP Lab\Lab Reports\Lab 9\task 1\task1.exe"
Enter value 3
21
Enter value 4
3
Enter value 5
221
Enter value 6
3
Enter value 7
123
Enter value 8
1213
Enter value 9
213
Enter value 10
12
Value 1 = 12
Value 2 = 32
Value 3 = 21
Value 4 = 3
Value 5 = 221
Value 6 = 3
Value 7 = 123
Value 8 = 1213
Value 9 = 213
Value 10 = 12

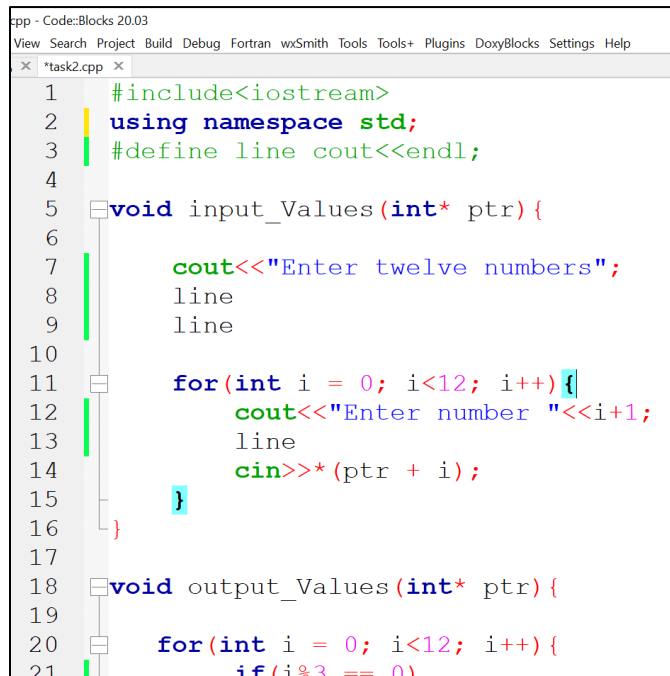
Process returned 0 (0x0)   execution time : 8.237 s
Press any key to continue.
```

TASK # 2:**Title:**

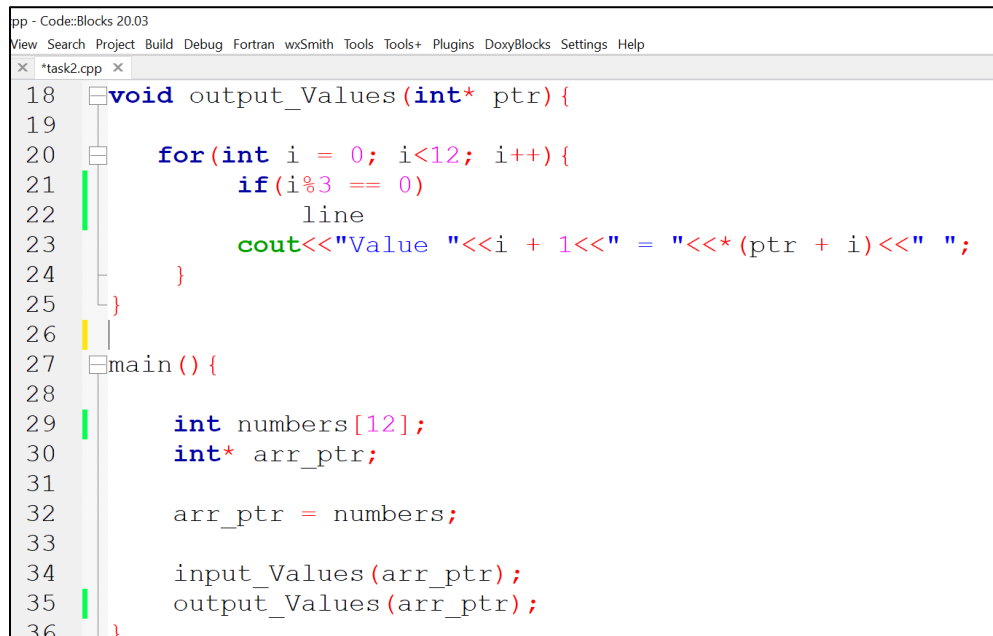
Write a program to input twelve numbers from use.....input values into the array and use pointer for outputting the values.

CODE SCREENSHOTS:

Here are the screenshots of the code.



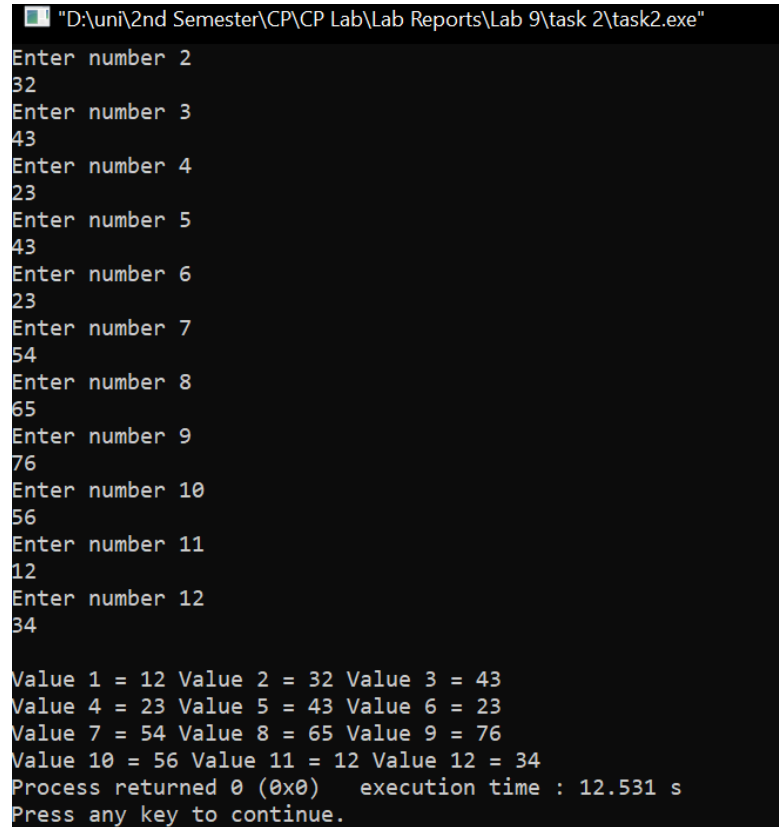
```
cpp - Code::Blocks 20.03
View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
*task2.cpp
1  #include<iostream>
2  using namespace std;
3  #define line cout<<endl;
4
5  void input_Values(int* ptr){
6
7      cout<<"Enter twelve numbers";
8      line
9      line
10
11     for(int i = 0; i<12; i++){
12         cout<<"Enter number "<<i+1;
13         line
14         cin>>*(ptr + i);
15     }
16 }
17
18 void output_Values(int* ptr){
19
20     for(int i = 0; i<12; i++){
21         if(i%3 == 0)
```



```
cpp - Code::Blocks 20.03
View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
*task2.cpp
18 void output_Values(int* ptr){
19
20     for(int i = 0; i<12; i++){
21         if(i%3 == 0)
22             line
23         cout<<"Value "<<i + 1<<" = "<<*(ptr + i)<<" ";
24     }
25 }
26
27 main(){
28
29     int numbers[12];
30     int* arr_ptr;
31
32     arr_ptr = numbers;
33
34     input_Values(arr_ptr);
35     output_Values(arr_ptr);
36 }
```

OUTPUT (COMPILATION, DEBUGGING & TESTING):

Here are the screenshots of the output of above code.



```
"D:\uni\2nd Semester\CP\CP Lab\Lab Reports\Lab 9\task 2\task2.exe"
Enter number 2
32
Enter number 3
43
Enter number 4
23
Enter number 5
43
Enter number 6
23
Enter number 7
54
Enter number 8
65
Enter number 9
76
Enter number 10
56
Enter number 11
12
Enter number 12
34

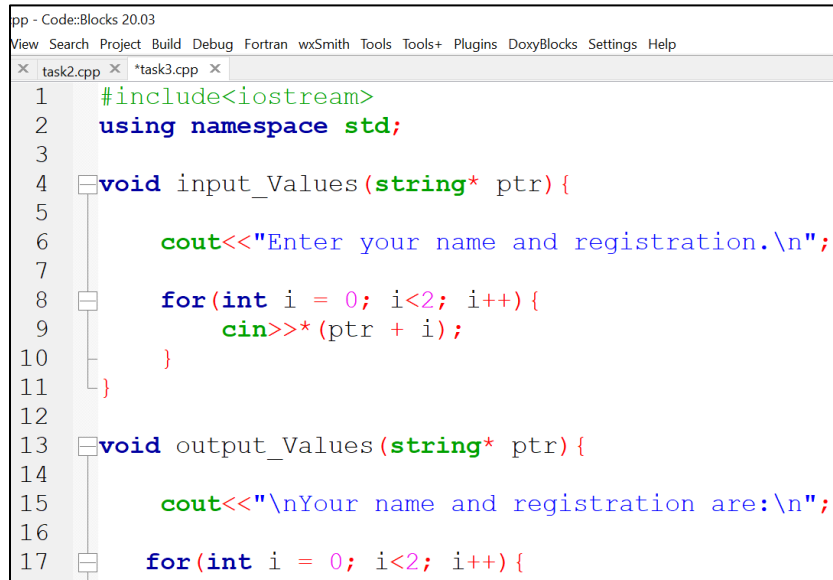
Value 1 = 12 Value 2 = 32 Value 3 = 43
Value 4 = 23 Value 5 = 43 Value 6 = 23
Value 7 = 54 Value 8 = 65 Value 9 = 76
Value 10 = 56 Value 11 = 12 Value 12 = 34
Process returned 0 (0x0)   execution time : 12.531 s
Press any key to continue.
```

TASK # 3:**Title:**

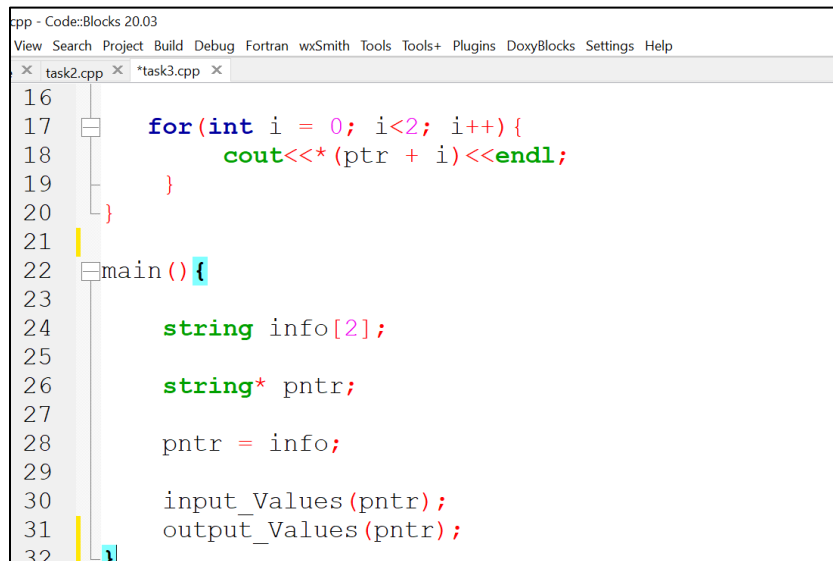
Write a program where you create a string array of size 2.....Display them both then using the pointer.

CODE SCREENSHOTS:

Here are the screenshots of the code.



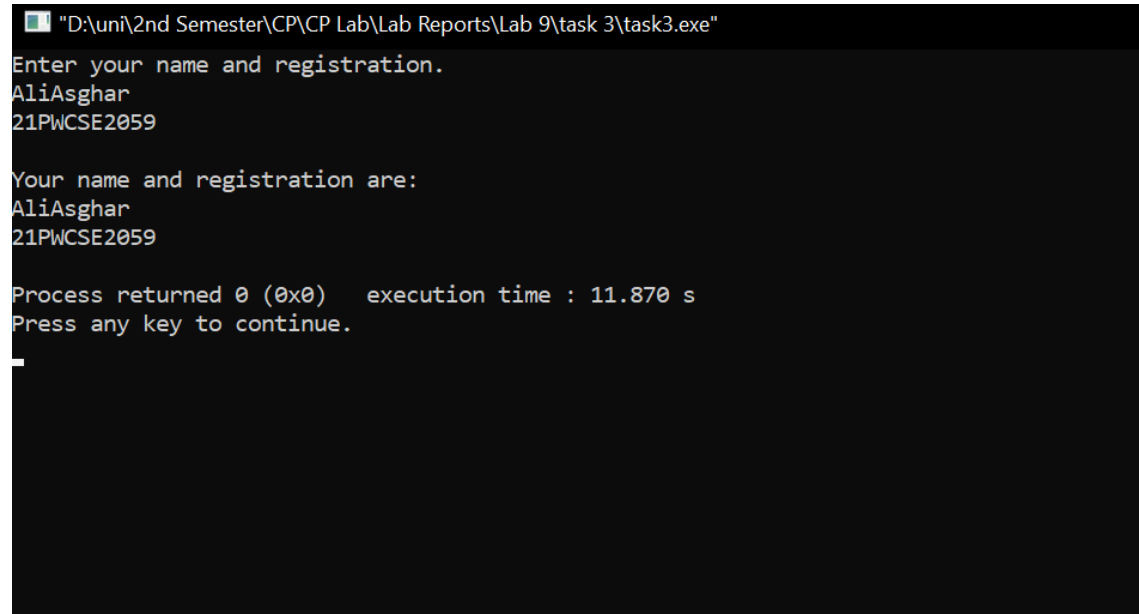
```
pp - Code::Blocks 20.03
View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
task2.cpp task3.cpp
1  #include<iostream>
2  using namespace std;
3
4  void input_Values(string* ptr){
5
6      cout<<"Enter your name and registration.\n";
7
8      for(int i = 0; i<2; i++){
9          cin>>*(ptr + i);
10     }
11 }
12
13 void output_Values(string* ptr){
14
15     cout<<"\nYour name and registration are:\n";
16
17     for(int i = 0; i<2; i++){
```



```
16
17     for(int i = 0; i<2; i++){
18         cout<<*(ptr + i)<<endl;
19     }
20 }
21
22 main(){
23
24     string info[2];
25
26     string* pntr;
27
28     pntr = info;
29
30     input_Values(pntr);
31     output_Values(pntr);
32 }
```

OUTPUT (COMPILATION, DEBUGGING & TESTING):

Here is the screenshot of the output of above code.



```
"D:\uni\2nd Semester\CP\CP Lab\Lab Reports\Lab 9\task 3\task3.exe"
Enter your name and registration.
AliAsghar
21PWCSE2059

Your name and registration are:
AliAsghar
21PWCSE2059

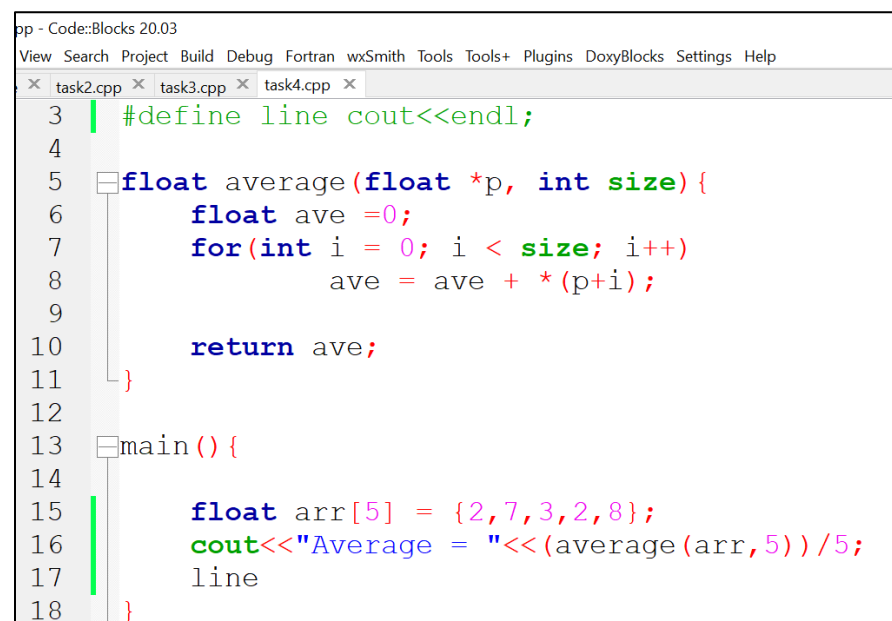
Process returned 0 (0x0)   execution time : 11.870 s
Press any key to continue.
```

TASK # 4:**Title:**

Write a program which calculates the.....(which is the size of array) i.e average(int *arr , int size).

CODE SCREENSHOTS:

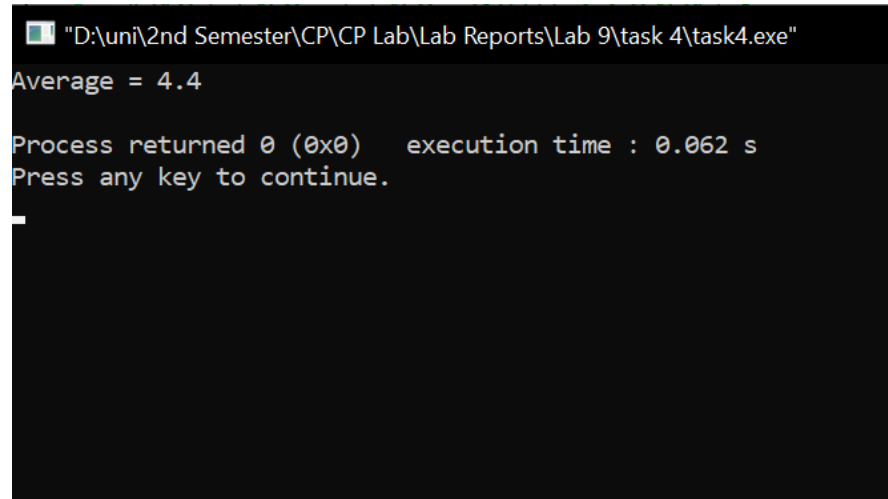
Here is the screenshot of the code.



```
pp - Code::Blocks 20.03
View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
task2.cpp task3.cpp task4.cpp
3 | #define line cout<<endl;
4
5 | float average(float *p, int size) {
6 |     float ave = 0;
7 |     for(int i = 0; i < size; i++)
8 |         ave = ave + *(p+i);
9
10 |     return ave;
11 | }
12
13 | main() {
14
15 |     float arr[5] = {2, 7, 3, 2, 8};
16 |     cout<<"Average = "<<(average(arr, 5))/5;
17 |     line
18 | }
```

OUTPUT (COMPILATION, DEBUGGING & TESTING):

Here is the screenshot of the output of above code.



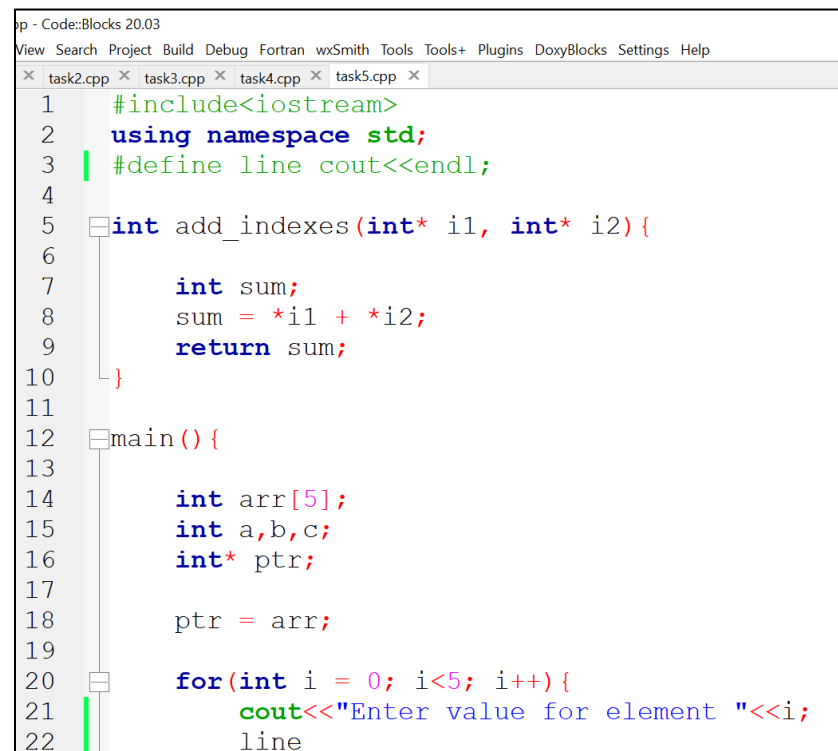
```
"D:\uni\2nd Semester\CP\CP Lab\Lab Reports\Lab 9\task 4\task4.exe"
Average = 4.4
Process returned 0 (0x0)  execution time : 0.062 s
Press any key to continue.
_
```

TASK # 5:**Title:**

Write a C++ program where you declare an array of 5.....the first index of array in main().

CODE SCREENSHOTS:

Here are the screenshots of the code.



```

1  #include<iostream>
2  using namespace std;
3  #define line cout<<endl;
4
5  int add_indexes(int* i1, int* i2){
6
7      int sum;
8      sum = *i1 + *i2;
9      return sum;
10 }
11
12 main(){
13
14     int arr[5];
15     int a,b,c;
16     int* ptr;
17
18     ptr = arr;
19
20     for(int i = 0; i<5; i++){
21         cout<<"Enter value for element "<<i;
22         line

```



```
pp - Code::Blocks 20.03
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task2.cpp task3.cpp task4.cpp task5.cpp
19
20     for(int i = 0; i<5; i++){
21         cout<<"Enter value for element "<<i;
22         line
23         cin>>*(ptr + i);
24     }
25
26     cout<<"Enter value of a";
27     line
28     cin>>a;
29     cout<<"Enter value of b";
30     line
31     cin>>b;
32
33     c = add_indexes(arr + (a-1), arr + (b-1));
34
35     arr[0] = c;
36
37     cout<<"First element = "<<arr[0];
38     line
39 }
```

OUTPUT (COMPILATION, DEBUGGING & TESTING):

Here is the screenshot of the output of above code.

```
"D:\uni\2nd Semester\CP\CP Lab\Lab Reports\Lab 9\task 5\task5.exe"
Enter value for element 0
12
Enter value for element 1
32
Enter value for element 2
21
Enter value for element 3
32
Enter value for element 4
54
Enter value of a
2
Enter value of b
3
First element = 53

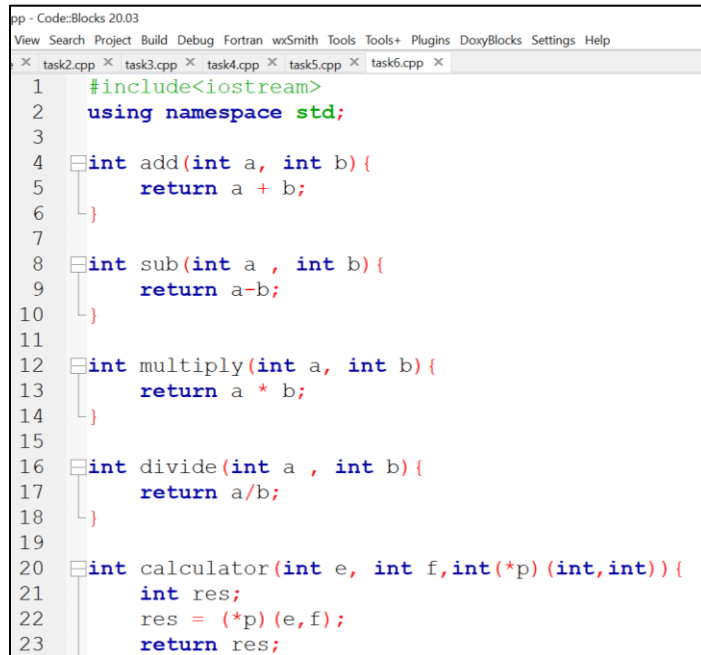
Process returned 0 (0x0)   execution time : 11.017 s
Press any key to continue.
■
```

TASK # 6:**Title:**

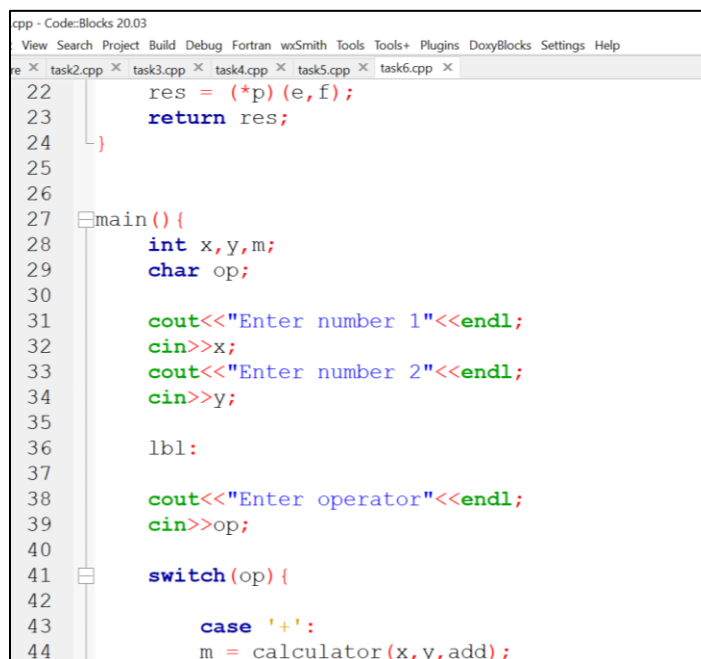
Write a C++ program where you create 4.....in main() x value will become 9.

CODE SCREENSHOTS:

Here are the screenshots of the code.



```
cpp - Code::Blocks 20.03
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task2.cpp task3.cpp task4.cpp task5.cpp task6.cpp
1  #include<iostream>
2  using namespace std;
3
4  int add(int a, int b){
5      return a + b;
6  }
7
8  int sub(int a , int b){
9      return a-b;
10 }
11
12 int multiply(int a, int b){
13     return a * b;
14 }
15
16 int divide(int a , int b){
17     return a/b;
18 }
19
20 int calculator(int e, int f,int(*p)(int,int)){
21     int res;
22     res = (*p)(e,f);
23     return res;
```



```
cpp - Code::Blocks 20.03
View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
task2.cpp task3.cpp task4.cpp task5.cpp task6.cpp
22     res = (*p)(e,f);
23     return res;
24 }
25
26
27 main(){
28     int x,y,m;
29     char op;
30
31     cout<<"Enter number 1"<<endl;
32     cin>>x;
33     cout<<"Enter number 2"<<endl;
34     cin>>y;
35
36     lbl:
37
38     cout<<"Enter operator"<<endl;
39     cin>>op;
40
41     switch(op){
42
43         case '+':
44             m = calculator(x,y,add);
```

```
cpp - Code::Blocks 20.03
View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
task2.cpp task3.cpp task4.cpp task5.cpp task6.cpp
42
43     case '+':
44         m = calculator(x,y,add);
45         break;
46
47     case '-':
48         m = calculator(x,y,sub);
49         break;
50
51     case '*':
52         m = calculator(x,y,multiply);
53         break;
54
55     case '/':
56         m = calculator(x,y,divide);
57         break;
58
59     default:
60         cout<<"Please enter a valid operator\n\n";
61         goto lbl;
62         break;
63 }
64
```

OUTPUT (COMPILATION, DEBUGGING & TESTING):

Here are the screenshots of the output of above code.

```
"D:\uni\2nd Semester\CP\CP Lab\Lab Reports\Lab 9\task 6\task6.exe"
Enter number 1
12
Enter number 2
32
Enter operator
+
Result = 44
Process returned 0 (0x0)   execution time : 324.200 s
Press any key to continue.

```

```
"D:\uni\2nd Semester\CP\CP Lab\Lab Reports\Lab 9\task 6\task6.exe"
Enter number 1
32
Enter number 2
43
Enter operator
8
Please enter a valid operator

Enter operator
-
Result = -11
Process returned 0 (0x0)   execution time : 10.768 s
Press any key to continue.

```