CSE102L Computer Programming Lab

LAB # 9

2020

Submitted to:

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Registration No :

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Semester: **2nd**

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."

August , 5, 2020

Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

Pointer and References in Arrays and Functions

Objectives: To understand pointer role in arrays and functions.

Task 1

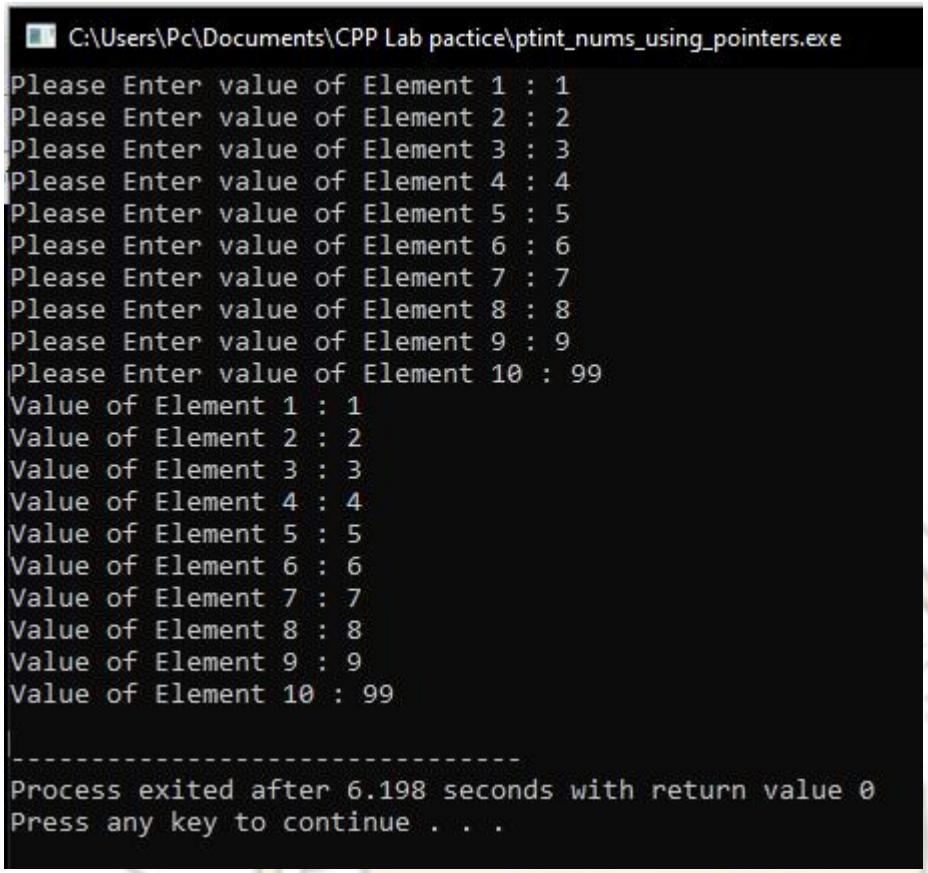
Title:

Write a C++ program where you make an array of 10 elements and get all elements value from user and display all elements using pointers.

Code:

```
#include<iostream>
using namespace std;
main()
{
int a[10], *ptr;
ptr = &a[0];
for(int i = 0; i<10 ; i++)
{
cout<<"Please Enter value of Element "<<i+1<<" : ";
cin>>*(ptr + i);
}
for(int n = 0; n<10 ; n++)
{
cout<<"Value of Element "<<n+1<<" : "<<*(ptr + n)<<endl;
}}
```

Output:



Task 2

Title:

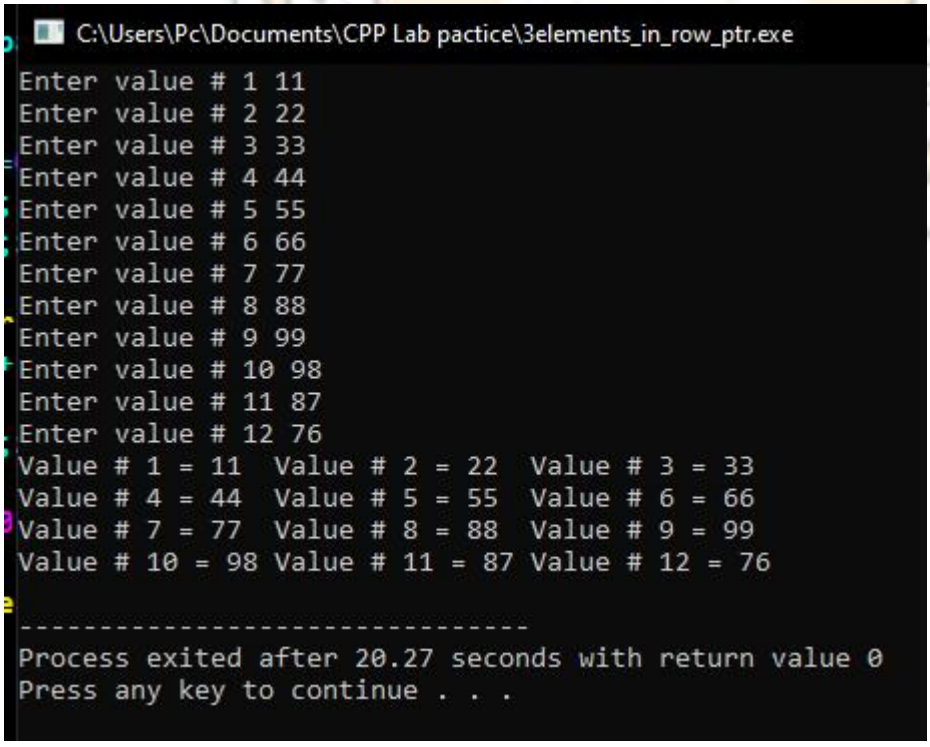
Write a C++ program where you create a 12 elements array and take user from input and then display them (3 elements in a row) using pointers.

Code:

```
#include<iostream>

using namespace std;

main()

{

int x[12],h=0,*ptr;

ptr = &x[0];
```

```
for(int i=0;i < 12;i++)
{
cout<<"Enter value # "<<i+1<<" ";
cin>>*(ptr + i);
}
for(int i=1;i < 5;i++)
{
 for(int j=0;j<3;j++)
{
cout<<"Value # "<<h+1<<" = "<<*(ptr + h)<<"\t";
h++;
}
cout<<endl;
}}
```

Output:



Task 3

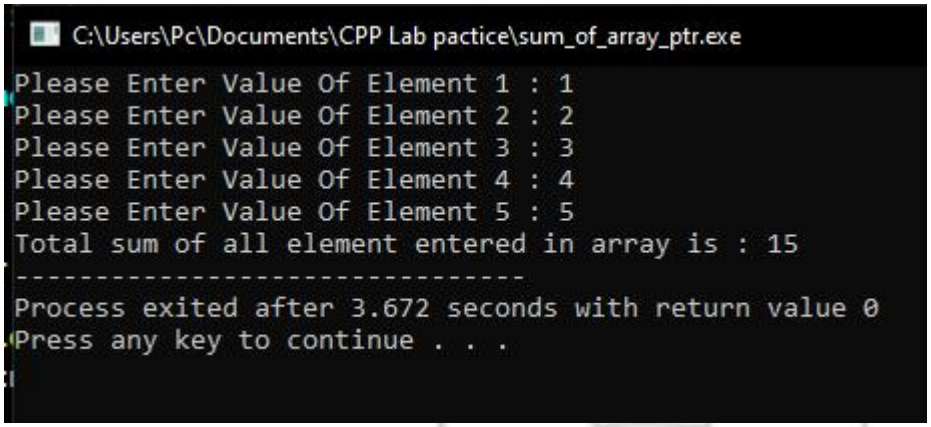
Title:

Write a C++ program where user enters values for 5 element array and then displays its sum.

Code:

```
#include<iostream>
using namespace std;
main()
{
int a[5], *ptr = &a[0] , sum = 0;
for(int i = 0 ; i < 5 ; i++)
{
cout<<"Please Enter Value Of Element "<<i+1<<" : ";
cin>>*(ptr + i);
}
for(int i = 0 ; i < 5 ; i++)
{
sum =sum + *(ptr + i);
}
cout<<"Total sum of all element entered in array is : "<<sum;
}
```

Output:



Task 4

Title:

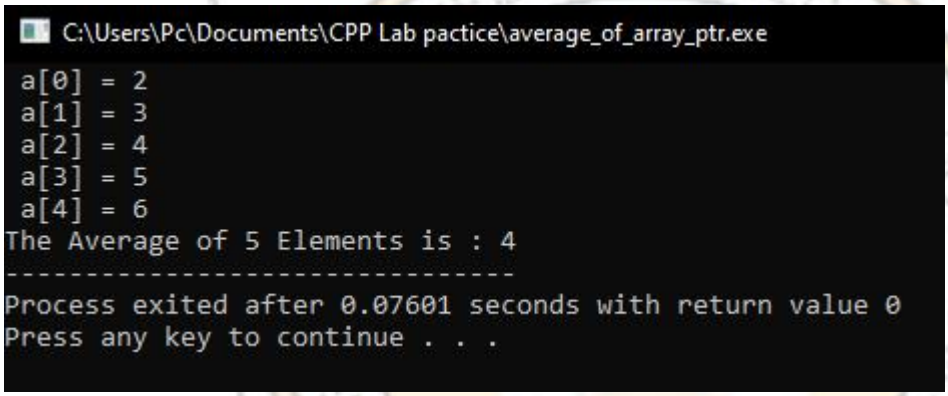
Write a C++ program where you create a 5 element array (hard code values) and then call a function average which takes pointer to the beginning of array and size of that array as its parameters and computes average.

Code:

```
#include<iostream>


using namespace std;

void average(int* , int);

main()

{

int a[5]={2,3,4,5,6};

for(int i = 0 ; i<5 ; i++)

{

cout<<" a["<<i<<"] = "<<a[i]<<endl;

}

average(a, 5);

}

void average(int *x, int size)
```

```
{
int sum=0;
for(int i = 0 ; i<5 ; i++)
{
sum = sum + *(x + i);
}
cout<<"The Average of 5 Elements is : "<<(float(sum)/size);
}
```

Output:



Task 5

Title:

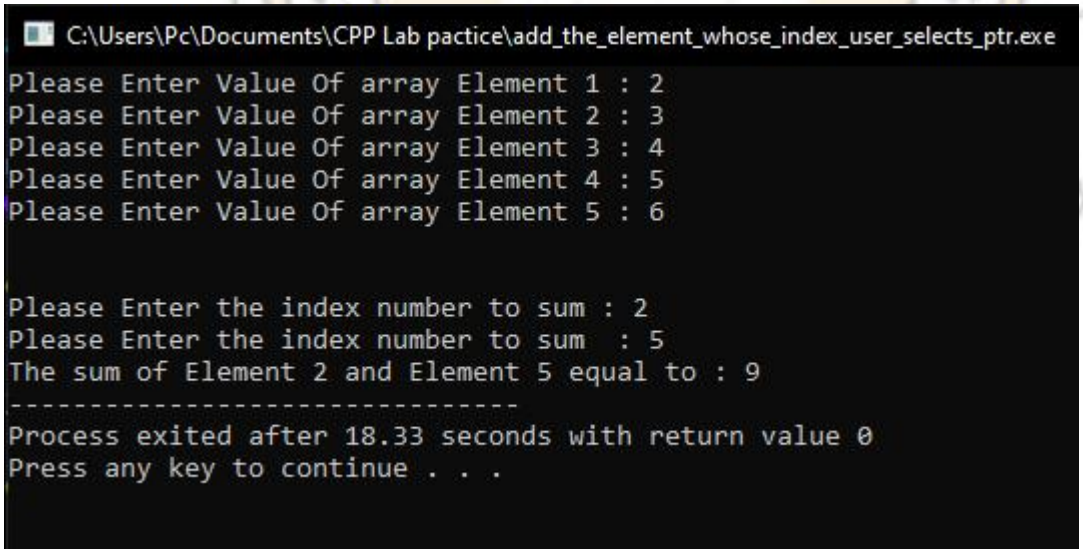
Write a C++ program where user enters values into a 5 element array using pointers and then enters two separate variables which indicates the indices of elements that need to be added in function that only accepts pointers and parameters.

Code:

```
#include<iostream>

using namespace std;
main()
```

```
{
int a[5],*ptr = &a[0], n, m, sum = 0;
for(int i = 0 ; i<5 ; i++)
{
cout<<"Please Enter Value Of array Element "<<i+1<<" : ";
cin>>*(ptr + i);
}
cout<<"\n\nPlease Enter the index number to sum : ";
cin>>n;
cout<<"Please Enter the index number to sum  : ";
cin>>m;
sum = *(ptr+ (n-1)) + *(ptr + (m-1));
cout<<"The sum of Element "<<n<<" and Element "<<m<<" equal to : "<<sum;
}
```

Output:



Task 6

Title:

A program which has four functions (addition, subtraction, division and multiplication) and a calculate function which takes two numbers and a pointer to function. Calculate passes these numbers to appropriate function.

Code:

```
#include<iostream>
using namespace std;
float addition(int *a, int *b);
float subtraction(int *a, int *b);
float division(int *a, int *b);
float multiplication(int *a, int *b);
float calculate(int *a, int *b, float((*function)(int*, int*)));
int main()
{
int a,b,c;
cout<<"Enter First number: ";
cin>>a;
cout<<"Enter Second number: ";
cin>>b;
cout<<" \n\n To Add Enter = 1 \n To Subtract Enter = 2 \n To Multiply Enter = 3 \n To Devide Enter = 4 \n\n Enter the operation = ";

cin>>c;
switch(c)
{
case 1:
cout<<"\nResult of Addition is "<<calculate(&a, &b,addition)<<endl;
break;
case 2:
```

```
cout<<"\nResult of Subtraction is "<<calculate(&a, &b,subtraction)<<endl;
break;
case 3:
cout<<"\nResult of Multiplication is "<<calculate(&a, &b,multiplication)<<endl;
break;
case 4:
cout<<"\nResult of Devision is "<<calculate(&a, &b,division)<<endl;
break;
default:
cout<<"Wrong Entry";
break;
}
}
float calculate(int *a, int *b, float((*function)(int*, int*)))
{
return function(a, b);
}
float addition(int *a, int *b)
{
return *a + *b;
}
float subtraction(int *a, int *b)
{
return *a - *b;
}
float multiplication(int *a, int *b)
{
return *a * *b;
```

```
}
float division(int *a, int *b)
{
return ((float) *a) / *b;
}
```

Output: