

University of engineering & technology Peshawar



COMPUTER PROGRAMMING -LAB

Lab report # 9

Spring 2020

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Section: B

Reg No: 19PWCSE1795

Semester: 2nd

“On my honor, as a student of University of Engineering and Technology Peshawar, I have neither given nor received unauthorized assistance on this academic work”

Student signature: _____

Submitted to:
Eng: Abdullah

Department Of Computer System Engineering

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.

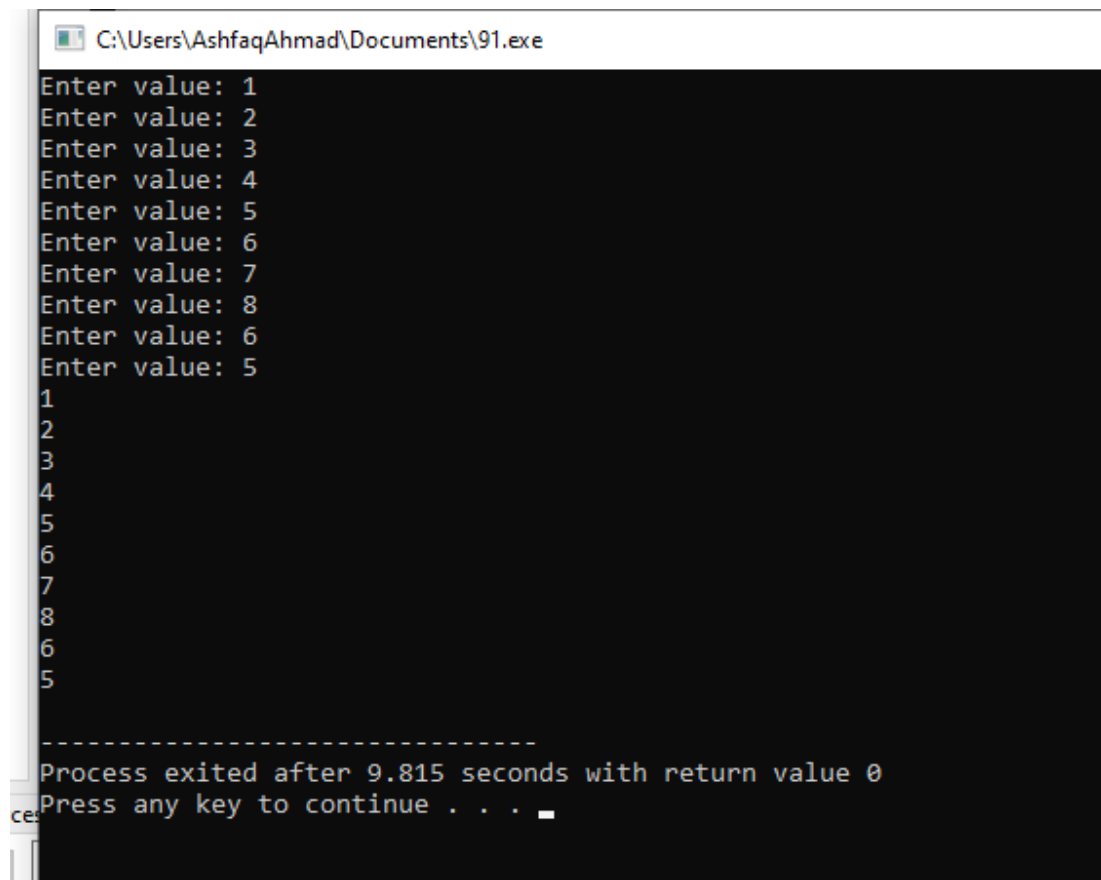
Code:

```
91.cpp
1  #include<iostream>
2  using namespace std;
3  int main() {
4      int a[10], *p = a;
5      for(int i = 0; i < 10; i++) {
6          cout<<"Enter value: ";
7          cin>>*p;
8          p++;
9      }
10     p = a;
11     for(int i = 0; i < 10; i++) {
12         cout<<*p<<endl;
13         p++;
14     }
15     return 0;
16 }
17
```

Compile Log Debug Find Results Close

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\AshfaqAhmad\Documents\91.exe
- Output Size: 1.83212089538574 MiB
- Compilation Time: 2.28s

Compilation:



The screenshot shows a Windows command prompt window titled "C:\Users\AshfaqAhmad\Documents\91.exe". The program prompts the user to "Enter value:" 12 times. The inputs are: 1, 2, 3, 4, 5, 6, 7, 8, 6, 5, and then two blank lines. The program then displays the 12 input values in a single column. At the bottom, it shows "Process exited after 9.815 seconds with return value 0" and "Press any key to continue . . .".

```
C:\Users\AshfaqAhmad\Documents\91.exe
Enter value: 1
Enter value: 2
Enter value: 3
Enter value: 4
Enter value: 5
Enter value: 6
Enter value: 7
Enter value: 8
Enter value: 6
Enter value: 5
1
2
3
4
5
6
7
8
6
5
-----
Process exited after 9.815 seconds with return value 0
Press any key to continue . . .
```

Task2:

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:

```
91.cpp
1  #include<iostream>
2  using namespace std;
3  int main() {
4      int a[12], *p = a;
5      for(int i = 0; i < 12; i++) {
6          cout<<"Enter value";
7          cin>>*p;
8          p++;
9      }
10     p = a;
11     for(int i = 0; i < 12; i=i+3) {
12         cout<<"Value "<<(i+1)<<" = "<<*p;
13         p++;
14         cout<<"\t\tValue "<<(i+2)<<" = "<<*p;
15         p++;
16         cout<<"\t\tValue "<<(i+3)<<" = "<<*p<<endl;
17         p++;
18     }
19     return 0;
20 }
21
```

es Compile Log Debug Find Results Close

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\AshfaqAhmad\Documents\91.exe
- Output Size: 1.83309745788574 MiB
- Compilation Time: 0.89s

Compilation:

```
C:\Users\AshfaqAhmad\Documents\91.exe
Enter value1
Enter value2
Enter value3
Enter value4
Enter value5
Enter value6
Enter value5
Enter value4
Enter value3
Enter value4
Enter value3
Enter value3
Value 1 = 1          Value 2 = 2          Value 3 = 3
Value 4 = 4          Value 5 = 5          Value 6 = 6
Value 7 = 5          Value 8 = 4          Value 9 = 3
Value 10 = 4         Value 11 = 3         Value 12 = 3

-----
Process exited after 11.12 seconds with return value 0
Press any key to continue . . .
```

Task 3:

Title:

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

Code:

```
91.cpp
1  #include<iostream>
2  using namespace std;
3  int main() {
4      int arr[5], *ptr = arr;
5      for(int i = 0; i < 5; i++) {
6          cout<<"Enter value ";
7          cin>>*ptr;
8          ptr++;
9      }
10     ptr = arr;
11     int sum = 0;
12     for(int i = 0; i < 5; i++) {
13         sum = sum + *ptr;
14         ptr++;
15     }
16     cout<<sum;
17     return 0;
18 }
19
20
```

Compile Log Debug Find Results Close

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\AshfaqAhmad\Documents\91.exe
- Output Size: 1.83193492889404 MiB
- Compilation Time: 0.88s

compilation:

```
C:\Users\AshfaqAhmad\Documents\91.exe
Enter value 3
Enter value 5
Enter value 6
Enter value 7
Enter value 3
24
-----
Process exited after 6.785 seconds with return value 0
Press any key to continue . . .
```

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:

```
91.cpp
1  #include<iostream>
2  float average(int *p, int s);
3  using namespace std;
4  int main() {
5      int arr[] = {55, -51, -83, 48,91};
6      cout<<average(arr, 5);
7  }
9  float average(int *p, int s) {
10     float sum = 0;
11     for(int i = 0; i< s; i++)
12         sum += *(p + i);
13     return sum/s;
14     return 0;
15 }
16
17
```

Compile Log Debug Find Results Close

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\AshfaqAhmad\Documents\91.exe
- Output Size: 1.83196544647217 MiB
- Compilation Time: 0.81s

compilation:

```
C:\Users\AshfaqAhmad\Documents\91.exe
12
-----
Process exited after 0.06331 seconds with return value 0
Press any key to continue . . .
```

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.

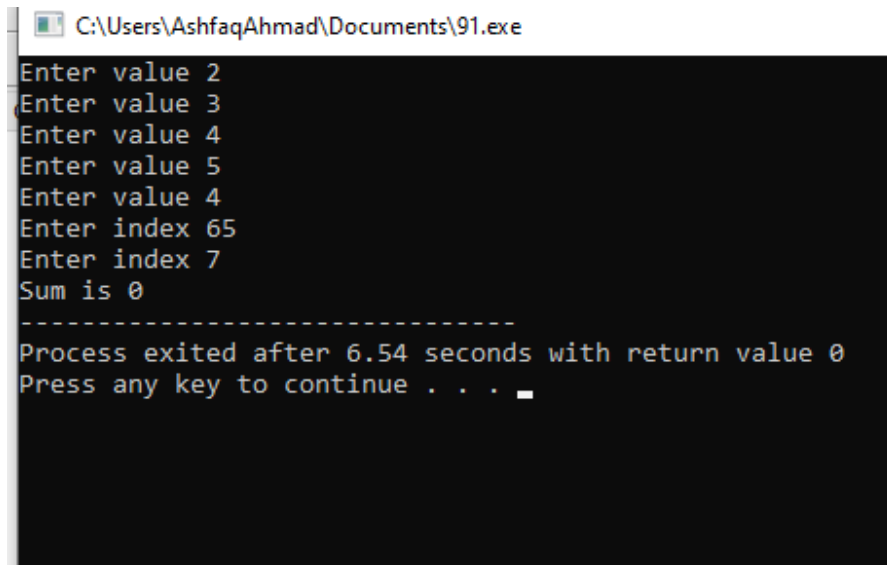
Code:

```
91.cpp
1  #include<iostream>
2  int add(int *array, int *f, int *s);
3  using namespace std;
4  int main() {
5      int arr[5], *ptr = arr, Shaaf1, second, *fptr = &Shaaf1, *sptr = &second;
6      for(int i = 0; i < 5; i++) {
7          cout<<"Enter value ";
8          cin>>*(ptr + i);
9      }
10     cout<<"Enter index ";
11     cin>>*fptr;
12     cout<<"Enter index ";
13     cin>>*sptr;
14     cout<<"Sum is "<<add(ptr, fptr, sptr);
15
16 }
17 int add(int *array, int *f, int *s) {
18     int ind1 = *f, ind2 = *s, sum = *(array+ind1) + *(array + ind2);
19     return sum;
20 }
21
```

Compile Log Debug Find Results Close

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\AshfaqAhmad\Documents\91.exe
- Output Size: 1.83294105529785 MiB
- Compilation Time: 0.80s

Compilation:



```
C:\Users\AshfaqAhmad\Documents\91.exe
Enter value 2
Enter value 3
Enter value 4
Enter value 5
Enter value 4
Enter index 65
Enter index 7
Sum is 0
-----
Process exited after 6.54 seconds with return value 0
Press any key to continue . . .
```

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:

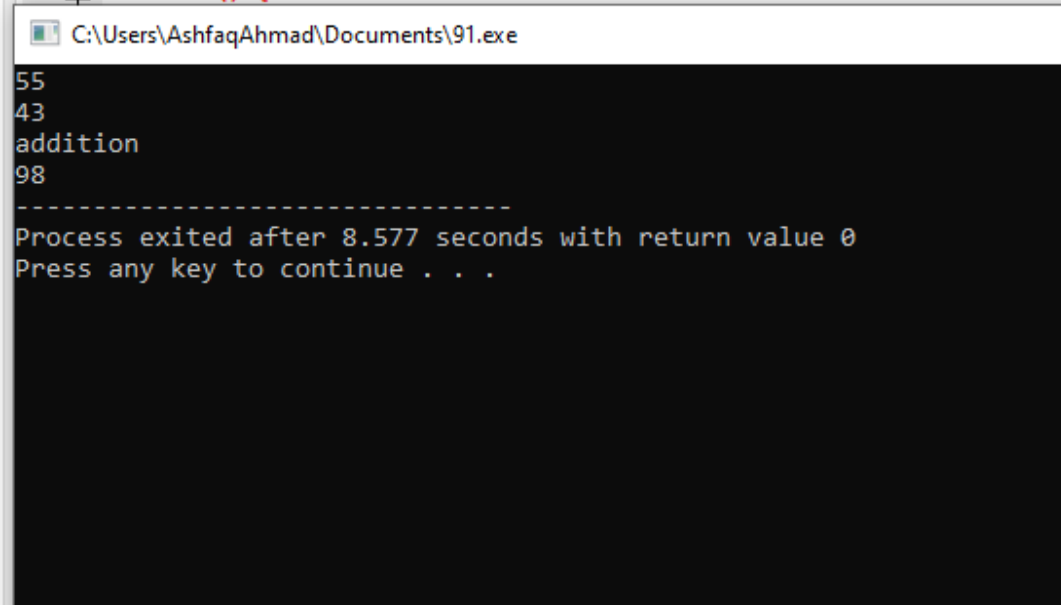
91.cpp

```
1  #include<iostream>
2  #include<string.h>
3  float addition(float *a, float *b);
4  float subtraction(float *a, float *b);
5  float division(float *a, float *b);
6  float multiplication(float *a, float *b);
7  float calculator(float *a, float *b, float((*function)(float *, float *)));
8  using namespace std;
9  int main() {
10     float n1, n2, *p1 = &n1, *p2 = &n2;
11     string d;
12     cin>>*p1>>*p2;
13     cin>>d;
14
15     if(d == "addition")
16         cout<<calculator(p1, p2, addition);
17     else if(d == "subtraction")
18         cout<<calculator(p1, p2, subtraction);
19     else if(d == "multiplication")
20         cout<<calculator(p1, p2, multiplication);
21     else if(d == "division")
22         cout<<calculator(p1, p2, division);
23     else
24         cout<<"invalid";
25 }
26 float addition(float *a, float *b) {
27     return *a + *b;
28 }
29 float subtraction(float *a, float *b) {
30     return *a - *b;
31 }
32 float multiplication(float *a, float *b) {
33     return *a * *b;
34 }
35 float division(float *a, float *b) {
36     return ((float)(*a/ *b));
37 }
38 float calculator(float *a, float *b, float((*function)(float *, float *))) {
39     return function(a, b);
40 }
41
```

 Compile Log  Debug  Find Results  Close

```
· Errors: 0
· Warnings: 0
· Output Filename: C:\Users\AshfaqAhmad\Documents\91.exe
· Output Size: 1.83343601226807 MiB
· Compilation Time: 0.86s
```

Compilation:



A screenshot of a Windows command prompt window. The title bar shows the file path "C:\Users\AshfaqAhmad\Documents\91.exe". The command prompt displays the following text: "55", "43", "addition", "98", followed by a line of dashes "-----". Below the dashes, it says "Process exited after 8.577 seconds with return value 0" and "Press any key to continue . . .".

```
C:\Users\AshfaqAhmad\Documents\91.exe
55
43
addition
98
-----
Process exited after 8.577 seconds with return value 0
Press any key to continue . . .
```

The End