

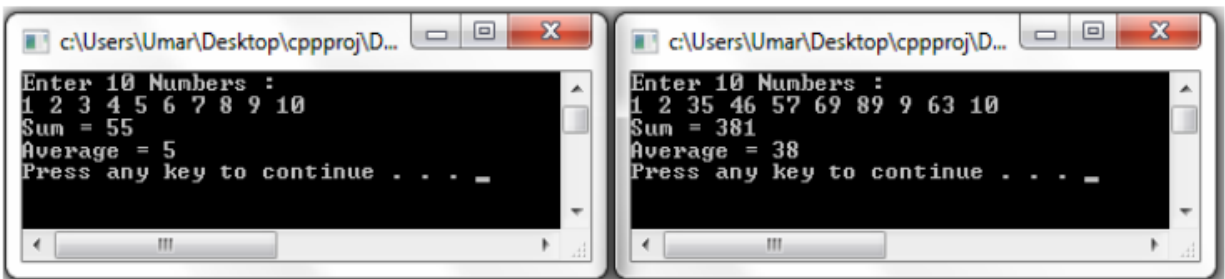
Chapter 10: Functions & Applications of Arrays

Laboratory Exercises (4)

Arrays and Loops

KEYWORDS: array, for, bool

Program 1: Write a function to print Sum and average of all the elements of an array. The parameters to function are array and size of the array. Use the function in your program for array of 10 elements.



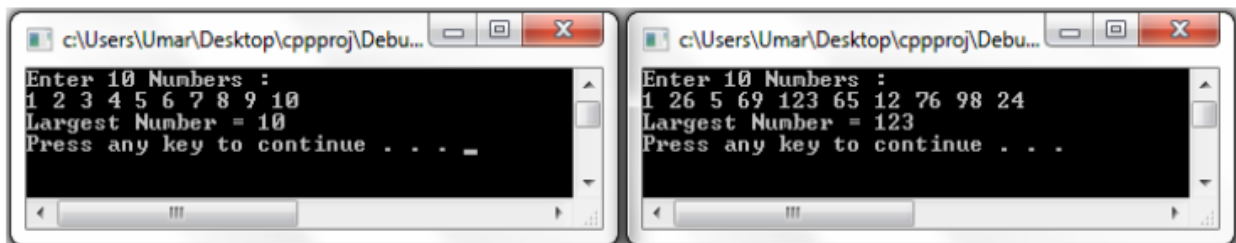
The image shows two side-by-side screenshots of a C++ program. Both windows have the title bar 'c:\Users\Umar\Desktop\cppproj\D...'. The left window shows the input '1 2 3 4 5 6 7 8 9 10', the calculated sum 'Sum = 55', and the average 'Average = 5'. The right window shows the input '1 2 35 46 57 69 89 9 63 10', the calculated sum 'Sum = 381', and the average 'Average = 38'. Both windows prompt the user to 'Press any key to continue'.

```
Enter 10 Numbers :  
1 2 3 4 5 6 7 8 9 10  
Sum = 55  
Average = 5  
Press any key to continue . . . _
```

```
Enter 10 Numbers :  
1 2 35 46 57 69 89 9 63 10  
Sum = 381  
Average = 38  
Press any key to continue . . . _
```

Sample Output

Program 2: Write a function to return the largest element of an array. The parameters to function are array and size of array. Use the function in your program for array of 10 elements.



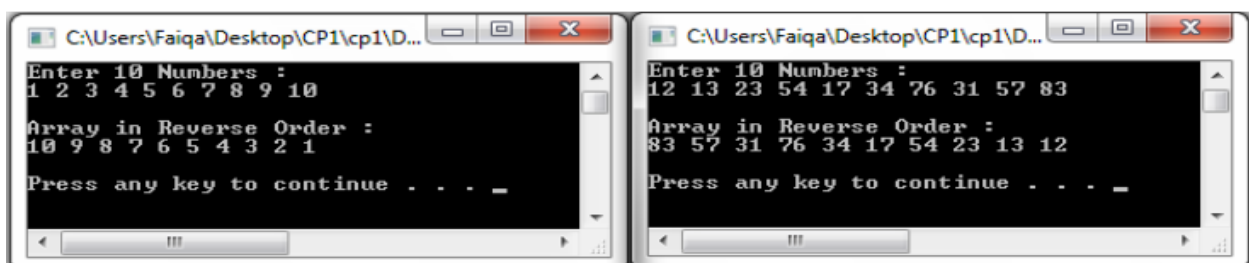
The image shows two side-by-side screenshots of a C++ program. Both windows have the title bar 'c:\Users\Umar\Desktop\cppproj\Debu...'. The left window shows the input '1 2 3 4 5 6 7 8 9 10' and the output 'Largest Number = 10'. The right window shows the input '1 26 5 69 123 65 12 76 98 24' and the output 'Largest Number = 123'. Both windows prompt the user to 'Press any key to continue'.

```
Enter 10 Numbers :  
1 2 3 4 5 6 7 8 9 10  
Largest Number = 10  
Press any key to continue . . . _
```

```
Enter 10 Numbers :  
1 26 5 69 123 65 12 76 98 24  
Largest Number = 123  
Press any key to continue . . . _
```

Sample Output

Program 3: Write a function to reverse the positions of elements of an array. Thus, the first element becomes last element of the array. The parameters to function are array and size of array. Use the function in your program for array of 10 elements.



The image shows two side-by-side screenshots of a C++ program. Both windows have the title bar 'C:\Users\Faiqa\Desktop\CP1\cp1\D...'. The left window shows the input '1 2 3 4 5 6 7 8 9 10' and the output 'Array in Reverse Order : 10 9 8 7 6 5 4 3 2 1'. The right window shows the input '12 13 23 54 17 34 76 31 57 83' and the output 'Array in Reverse Order : 83 57 31 76 34 17 54 23 13 12'. Both windows prompt the user to 'Press any key to continue'.

```
Enter 10 Numbers :  
1 2 3 4 5 6 7 8 9 10  
Array in Reverse Order :  
10 9 8 7 6 5 4 3 2 1  
Press any key to continue . . . _
```

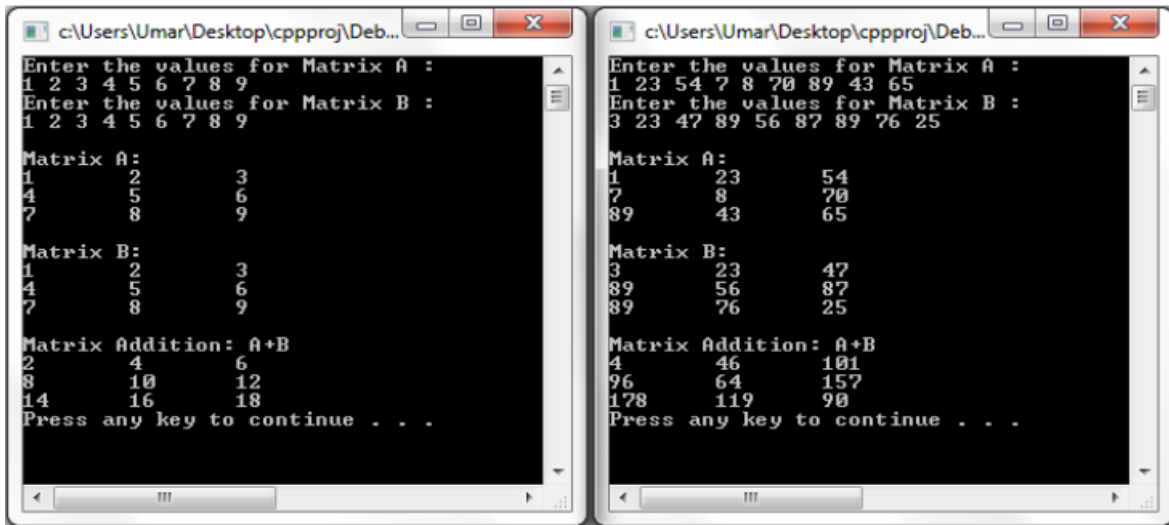
```
Enter 10 Numbers :  
12 13 23 54 17 34 76 31 57 83  
Array in Reverse Order :  
83 57 31 76 34 17 54 23 13 12  
Press any key to continue . . . _
```

Sample Output

2 Dimensional Arrays

KEYWORDS: array, for, nested loops.

Program 1: Write a program for addition of 3x3 arrays using function. The function should take three arrays and number of rows and columns as arguments.



```
c:\Users\Umar\Desktop\cppproj\Deb...
Enter the values for Matrix A :
1 2 3 4 5 6 7 8 9
Enter the values for Matrix B :
1 2 3 4 5 6 7 8 9

Matrix A:
1 2 3
4 5 6
7 8 9

Matrix B:
1 2 3
4 5 6
7 8 9

Matrix Addition: A+B
2 4 6
8 10 12
14 16 18
Press any key to continue . . .

c:\Users\Umar\Desktop\cppproj\Deb...
Enter the values for Matrix A :
1 23 54 7 8 70 89 43 65
Enter the values for Matrix B :
3 23 47 89 56 87 89 76 25

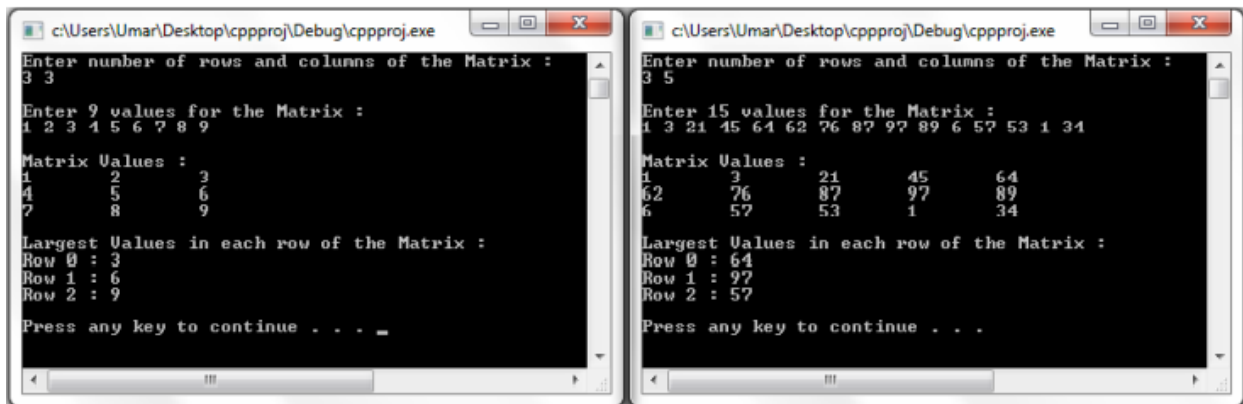
Matrix A:
1 23 54
7 8 70
89 43 65

Matrix B:
3 23 47
89 56 87
89 76 25

Matrix Addition: A+B
4 46 101
96 64 157
178 119 90
Press any key to continue . . .
```

Sample Output

Program 2: Write a program for printing the largest elements in each row of an array using function. The function should take an array and number of rows and columns as parameters.



```
c:\Users\Umar\Desktop\cppproj\Debug\cppproj.exe
Enter number of rows and columns of the Matrix :
3 3
Enter 9 values for the Matrix :
1 2 3 4 5 6 7 8 9

Matrix Values :
1 2 3
4 5 6
7 8 9

Largest Values in each row of the Matrix :
Row 0 : 3
Row 1 : 6
Row 2 : 9

Press any key to continue . . .

c:\Users\Umar\Desktop\cppproj\Debug\cppproj.exe
Enter number of rows and columns of the Matrix :
3 5
Enter 15 values for the Matrix :
1 3 21 45 64 62 76 87 97 89 6 57 53 1 34

Matrix Values :
1 3 21 45 64
62 76 87 97 89
6 57 53 1 34

Largest Values in each row of the Matrix :
Row 0 : 64
Row 1 : 97
Row 2 : 57

Press any key to continue . . .
```

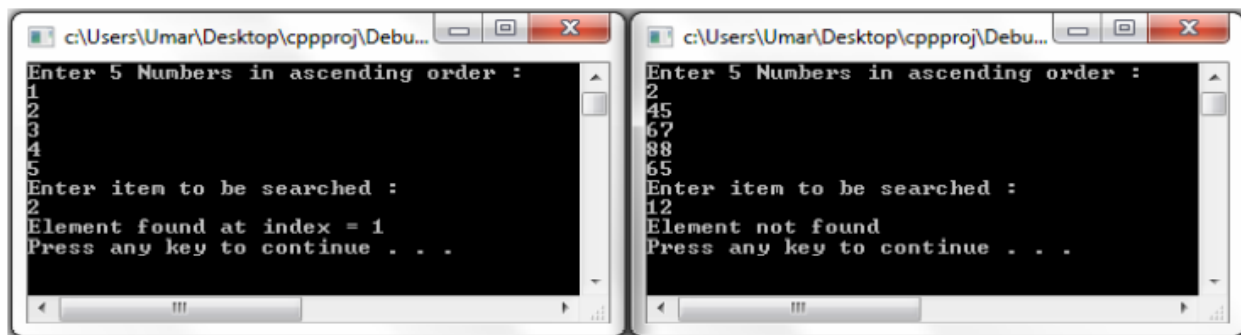
Sample Output

Sorting and Searching Techniques using Arrays

KEYWORDS: array, for, nested loops.

Program 1: Write a program for implementation of Sequential search using function.

Program 2: Write a program for implementation of Binary search using function.

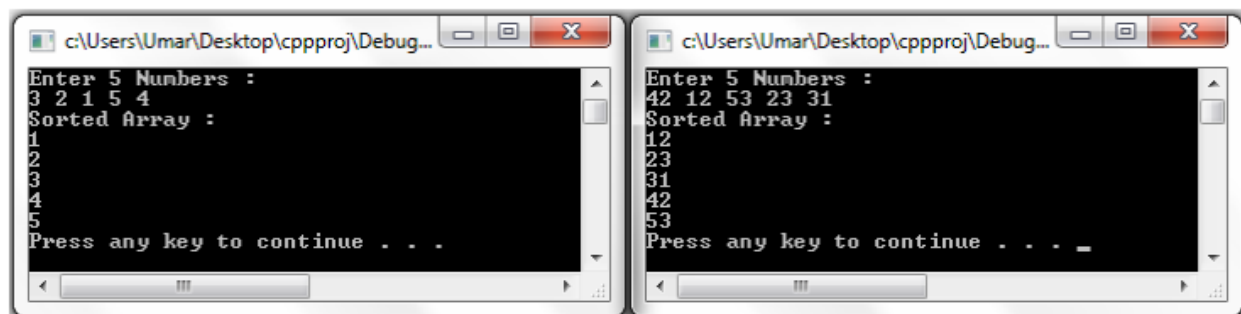


```
c:\Users\Umar\Desktop\cppproj\Debu...
Enter 5 Numbers in ascending order :
1
2
3
4
5
Enter item to be searched :
2
Element found at index = 1
Press any key to continue . . .

c:\Users\Umar\Desktop\cppproj\Debu...
Enter 5 Numbers in ascending order :
2
45
67
88
65
Enter item to be searched :
12
Element not found
Press any key to continue . . .
```

Sample Output

Program 3: Write a program for implementation of Bubble sort using function.



```
c:\Users\Umar\Desktop\cppproj\Debug...
Enter 5 Numbers :
3 2 1 5 4
Sorted Array :
1
2
3
4
5
Press any key to continue . . .

c:\Users\Umar\Desktop\cppproj\Debug...
Enter 5 Numbers :
42 12 53 23 31
Sorted Array :
12
23
31
42
53
Press any key to continue . . .
```

Sample Output