

School Of Mechanical & Manufacturing Engineering, NUST
Department of Mechanical Engineering



CS-114 - Fundamentals of Programming

Lab Report # 08

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05-12-23



Lab Report # 08

Arrays

Objectives:

- To get an introduction of arrays
- Array Initialization
- Accessing array elements

Home Tasks:

Task 1:

Take an array and find the most repeated element in that array.

Code:

```
1  #include<iostream>
2  using namespace std;
3  int main()
4  {
5      int n;
6      cout << "Enter the number of elements in the array: ";
7      cin >> n;
8
9      int a[n]={};
10     cout << "Enter the elements of the array:" << endl;
11     for(int i = 0; i < n; i++)
12     {
13         cin >> a[i];
14     }
15
16     int max_repeat = 0, max = 0;
17
18     for(int i = 0; i < n; i++)
19     {
20         int rep = 0;
21         for(int j = 0; j < n; j++)
22         {
23             if(a[j] == a[i]) {
24                 rep++;
25             }
26         }
27         if(rep > max_repeat) {
28             max_repeat = rep;
29             max = a[i];
30         }
31     }
32 }
```



```
33 cout << "The element " << max << " is the most repeated. It was repeated " << max_repeat << " times." << endl;
34
35 int max_repeat2 = 0, max2 = 0;
36
37 for(int i = 0; i < n; i++)
38 {
39     int rep2 = 0;
40     for(int j = 0; j < n; j++)
41     {
42         if(a[j] == a[i])
43         {
44             rep2++;
45         }
46     }
47     if(rep2 > max_repeat && rep2 == max_repeat && a[i] != max)
48     {
49         max_repeat2 = rep2;
50         max2 = a[i];
51     }
52 }
53
54 if(max2 != 0 && max_repeat2 != 0)
55 {
56     cout << "The element " << max2 << " is also the most repeated. It was repeated " << max_repeat2 << " times." << endl;
57 }
58
59 return 0;
60
```

Output:

```
Enter the number of elements in the array: 7
Enter the elements of the array:
2
3
2
3
4
5
9
The element 2 is the most repeated. It was repeated 2 times.
The element 3 is also the most repeated. It was repeated 2 times.

-----
Process exited after 10.68 seconds with return value 0
Press any key to continue . . . |
```



Task 2:

Let's say an array is $a[8] = \{13, 15, 17, 9, 99, 77, 65, 43\}$. Find largest and smallest element.

Code:

```
1  #include<iostream>
2  using namespace std;
3  int main ()
4  {
5      int a[8] = {13, 15, 17, 9, 99, 77, 65, 43}, i, max, min;
6      cout << "The given array is: a[8] = {13, 15, 17, 9, 99, 77, 65, 43}"<<endl;
7
8      max = a[0];
9      for (i = 0; i < 8; i++)
10     {
11         if (max < a[i])
12             max = a[i];
13     }
14     min = a[0];
15     for (i = 0; i < 8; i++)
16     {
17         if (min > a[i])
18             min = a[i];
19     }
20     cout << "Largest element : " << max<<endl;
21     cout << "Smallest element : " << min;
22     return 0;
23 }
```

Output:

```
The given array is: a[8] = {13, 15, 17, 9, 99, 77, 65, 43}
Largest element : 99
Smallest element : 9
-----
Process exited after 0.1069 seconds with return value 0
Press any key to continue . . . |
```



Task 3:

Develop a program that takes 5 array elements from user. Swap position [2] element with position [4] element. (Hint: Use the same method of swapping values we used for variables using a third variable temp).

Code:

```
1  #include <iostream>
2  using namespace std;
3
4  int main()
5  {
6      int a[5];
7      cout<<"Enter the 5 elements of an array: ";
8      for(int i=0; i<5;i++)
9      {
10         cin>>a[i];
11     }
12
13     int temp = a[2];
14     a[2] = a[4];
15     a[4] = temp;
16
17     cout<<"Switched Array: ";
18     for(int i=0; i<5;i++)
19     cout<<a[i]<<" ";
20     return 0;
21 }
```

Output:

```
Enter the 5 elements of an array: 34 55 27 13 74
Switched Array: 34 55 74 13 27
-----
Process exited after 14.87 seconds with return value 0
Press any key to continue . . . |
```

Conclusion:

We learned about arrays. We learned how to input elements in arrays and display an array. We also learned how to compare elements in an array, and how to check for repeated elements. We also learned how to swap elements of an array.