School Of Mechanical & Manufacturing Engineering, NUST

Department of Mechanical Engineering

CS-114 - Fundamentals of Programming

Lab Report # 07

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Arrays

Objectives:

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

Lab Tasks:

Task 1:

Take 10 integer inputs from user and store them in an array and print them on screen.

Code:

```
#include <iostream>
using namespace std;

int main()
{
    int a[9], i;
    cout<<"Enter 10 numbers: ";

    for(i=0; i<10; i++)
    {
        cin>>a[i];
    }

    for(i=0; i<10; i++)
    {
        cout<<a[i]<<" ";
    }
    return 0;

}
```

Output:

```
Enter 10 numbers: 4 5 6 7 2 5 7 1 9 16
4 5 6 7 2 5 7 1 9 16
--------------------------------
Process exited after 17.47 seconds with return value 0
Press any key to continue . . .
```

Task 2:

Write a program to find the sum and product of all elements of an array with 5 integer elements.

Code:

```cpp
#include <iostream>
using namespace std;

int main()
{
    int arr[4], i, sum = 0, pro = 1;

    cout <<"Enter 5 elements of the array: ";
    for ( i = 0; i < 5; i++)
    {
        cin >> arr[i];
    }

    for ( i = 0; i < 5; i++)
    {
        sum += arr[i];
        pro *= arr[i];
    }
    cout << "Sum of array elements : " << sum<<endl;
    cout << "Product of array elements : " << pro;
    return 0;

}
```

Output:

```
Enter 5 elements of the array: 4 7 8 9 10
Sum of array elements : 38
Product of array elements : 20160
--------------------------------
Process exited after 11.87 seconds with return value 0
Press any key to continue . . .
```

Task 3:

Print diamond patterns using a single array.

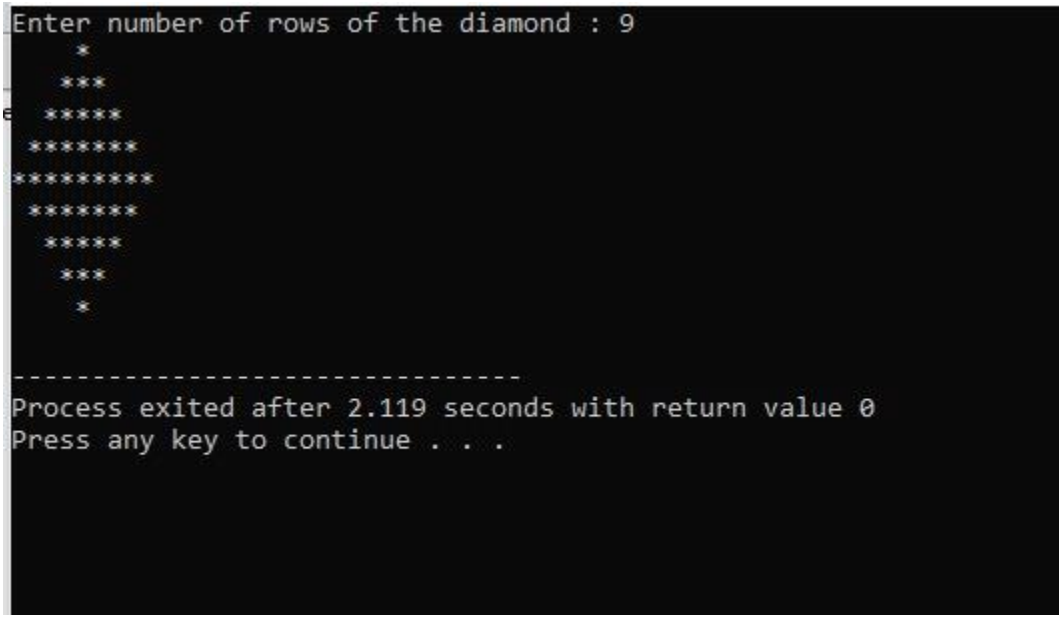
Code:

```
#include<cstring>
#include<iostream>
using namespace std;
int main()
{
    int numofrows;
    cout<<"Enter number of rows of the diamond : ";
    cin>>numofrows;

    if(numofrows % 2 == 0 )
    {cout<<"Please enter an odd number of rows."<<endl; return 0;}

    else
    {
        char diamond[numofrows];
        int half = numofrows/2;
// for upper half of diamond
        for(int i=0; i<=numofrows; i++){diamond[i]=' ';}
        for(int j=0; j<=half; j++)
        { diamond[half-j]='*';
          diamond[half+j]='*';
            for(int x=0; x<numofrows; x++){cout<<diamond[x];}
        cout<<endl;
        }
//for lower half of diamond
        for(int i=0; i<half; i++)
        {diamond[numofrows-1-i]=' ';
         diamond[i]=' ';
            for(int j=0; j<numofrows; j++){cout<<diamond[j];}
            cout<<endl;
        }
    }
return 0;
}
```

Output:



Conclusion:

We learned about arrays. We learnt how to input elements in arrays and how to display an array. Finally we learnt how to use them for different purposes.