



***School of Mechanical & Manufacturing Engineering (SMME),  
National University of Science and Technology (NUST),  
Sector H-12, Islamabad***

Program: BE-Aerospace      Section: AE-01  
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Course Title: Fundamentals of Programming (CS-109)

## **Lab Assignment**

***Name: Hassan Tariq***

***CMS: 456012***

**Question no 1: Write a C++ program, take two strings as input from the user and check if both strings are equal or not. If they are equal make them unequal by rotating string. e.g., Hello is turned into olleH etc.**

### **ANSWER**

```
1  #include <iostream>
2  using namespace std;
3  int main()
4  {
5      char str1[30],str2[30];
6      int count,counter=0;
7      cout<<"Enter first string: ";
8      cin>>str1;
9      cout<<"Enter second string: ";
10     cin>>str2;
11     for(int i=0;str1[i]!='\0' || str2[i]!='\0';i++)
12     {
13         counter++;
14         if(str1[i]!=str2[i])
15             {++count;}
16     }
17     if (count==0)
18     {
19         cout<<"Strings are equal."<<endl;
20         cout<<"New string is :";
21         for(int i=counter;i>=0;i--)
22         {
23             cout<<str1[i];
24         }
25     }
26     else
27     {
28         cout<<"Strings are not equal.";
29     }
30     return 0;
31 }
32
```

### **OUTPUT:**

```
Enter first string: someone
Enter second string: someone
Strings are equal.
New string is :enoemos
```

## **CODE:**

```
#include <iostream>
using namespace std;
int main()
{
    char str1[30],str2[30];
    int count,counter=0;
    cout<<"Enter first string: ";
    cin>>str1;
    cout<<"Enter second string: ";
    cin>>str2;
    for(int i=0;str1[i]!='\0'||str2[i]!='\0';i++)
    {
        counter++;
        if(str1[i]!=str2[i])
            {++count;}
    }
    if (count==0)
    {
        cout<<"Strings are equal."<<endl;
        cout<<"New string is :";
        for(int i=counter;i>=0;i--)
        {
            cout<<str1[i];
        }
    }
    else
    {
        cout<<"Strings are not equal.";
    }
    return 0;
}
```

**Question no 2: Write a C++ program for a string which may contain lowercase and uppercase characters. The task is to remove all duplicate characters from the string and find the resultant string.**

**ANSWER:**

```
1  #include <iostream>
2  using namespace std;
3
4  int main()
5  {
6      string str;
7      cout << "Enter a string: ";
8      cin >> str;
9      string result = "";
10     for (char &c : str)
11     {
12         if (result.find(c) == string::npos)
13         {
14             result = result + c;
15         }
16     }
17     cout << "Resultant string after removing duplicates: " << result;
18     return 0;
19 }
```

**OUTPUT:**

```
Enter a string: somebody
Resultant string after removing duplicates: somebody
```

**CODE:**

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

int main()
{
    string str;
    cout << "Enter a string: ";
    cin >> str;
    string result = "";
    for (char &c : str)
    {
        if (result.find(c) == string::npos)
        {
```

```

        result = result + c;
    }
}
cout << "Resultant string after removing duplicates: " << result;
return 0;
}

```

**Question no 3: Suppose an integer array a[5] = {1,2,3,4,5}. Add more elements to it and display them in C++**

### **ANSWER:**

```

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

```

### **OUTPUT:**

```

Enter 3 more integers: 5
12
4
1 2 3 4 5 5 12 4

```

### **CODE:**

```

#include <iostream>
using namespace std;
int main()
{
    int a[8] = {1, 2, 3, 4, 5};
    cout << "Enter 3 more integers: ";
    for (int i = 5; i < 8; i++)
    {

```

```

        cin >> a[i];
    }
    for (int i = 0; i < 8; i++)
    {
        cout << a[i] << " ";
    }
    return 0;
}

```

**Question no 4: Write a C++ program that uses a while loop to find the largest prime number less than a given positive integer N. Your program should take the value of N as input from the user and then find the largest prime number less than or equal to N. You are not allowed to use any library or pre-existing functions to check for prime numbers.**

**ANSWER:**

```

1  #include <iostream>
2  using namespace std;
3  int main()
4  {
5      int n,count=0;
6      cout<<"Enter number= ";
7      cin>>n;
8      int k,i=1;
9      while(i<=n)
10     {
11         count=0;
12         int j=1;
13         while(j<=i)
14         {
15             if(i%j==0){count++;}
16             j++;
17         }
18         if(count==2){ k=i;}
19         i++;
20     }
21     cout<<"The largest prime number equal or less than given number is "<<k;
22     return 0;
23 }

```

**OUTPUT:**

```

Enter number= 5774
The largest prime number equal or less than given number is 5749

```

**CODE:**

```
#include <iostream>
using namespace std;
int main()
{
    int n,count=0;
    cout<<"Enter number= ";
    cin>>n;
    int k,i=1;
    while(i<=n)
    {
        count=0;
        int j=1;
        while(j<=i)
        {
            if(i%j==0){count++;}
            j++;
        }
        if(count==2){ k=i;}
        i++;
    }
    cout<<"The largest prime number equal or less than given number is "<<k;
    return 0;
}
```

**Question no 5: Implement Bubble Sort on an array of 6 integers.**

**ANSWER:**

```

1  #include <iostream>
2  using namespace std;
3  int main()
4  {   int array[6];
5      cout<<"Enter 6 integers:"<<endl;
6      for(int i=0;i<6;i++)
7      {cin>>array[i];}
8      cout<<"Unsorted array is: "<<endl;
9      for (int i= 0; i < 6; i++)
10     {
11         cout << array[i] << " ";
12         cout << endl;
13     }
14     for(int i=0;i<5;i++)
15     {
16         for(int j=0;j<5;j++)
17         {
18             if(array[j]>array[j+1])
19             { //Swap the array elements
20                 array[j]=array[j]+array[j+1];
21                 array[j+1]=array[j]-array[j+1];
22                 array[j]=array[j]-array[j+1];
23             }
24         }
25     }
26     cout<<"Bubble Sorted array is: "<<endl;
27     for (int i= 0; i < 6; i++)
28     {
29         cout << array[i] << " ";
30         cout << endl;
31     }
32     return 0;

```

## **OUTPUT:**

```

Enter 6 integers:
99
5
756
35
21
34
Unsorted array is:
99
5
756
35
21
34
Bubble Sorted array is:
5
21
34
35
99
756

```



## **CODE:**

```
#include <iostream>
using namespace std;
int main()
{
    int array[6];
    cout<<"Enter 6 integers:"<<endl;
    for(int i=0;i<6;i++)
    {cin>>array[i];}
    cout<<"Unsorted array is: "<<endl;
    for (int i= 0; i < 6; i++)
    {
        cout << array[i] << " ";
        cout << endl;
    }
    for(int i=0;i<5;i++)
    {
        for(int j=0;j<5;j++)
        {
            if(array[j]>array[j+1])
            { //Swap the array elements
                array[j]=array[j]+array[j+1];
                array[j+1]=array[j]-array[j+1];
                array[j]=array[j]-array[j+1];
            }
        }
    }
    cout<<"Bubble Sorted array is: "<<endl;
    for (int i= 0; i < 6; i++)
    {
        cout << array[i] << " ";
        cout << endl;
    }
    return 0;
}
```

### Question no 6: Solve any Aerospace/Real Life Problem using C++ Programming

#### ANWER:

```
1  #include <iostream>
2  #include <cmath>
3  using namespace std;
4  int main()
5  { int v,angle,g,R;
6  cout<<"enter initial velocity (v) ";
7  cin>>v;
8  cout<<"enter angle of projection ";
9  cin>>angle;
10 cout<<"enter g ";
11 cin>>g;
12 double angleinrad= angle*3.14/180;
13 R=(v*v*sin(2*angleinrad))/g;
14 cout<<"range is "<<R;
15 return 0;}
```

#### OUTPUT:

```
/tmp/Qx5x1/fctK.o
enter initial velocity (v) 50
enter angle of projection 45
enter g 9.8
range is 277
```

#### CODE:

```
#include <iostream>
#include <cmath>
using namespace std;
int main()
{ int v,angle,g,R;
cout<<"enter initial velocity (v) ";
cin>>v;
cout<<"enter angle of projection ";
```

```
cin>>angle;
cout<<"enter g ";
cin>>g;
double angleinrad= angle*3.14/180;
R=(v*v*sin(2*angleinrad))/g;
cout<<"range is "<<R;
return 0;}
```