
NUST

NATIONAL UNIVERSITY
OF SCIENCES & TECHNOLOGY

# CS-114 - Fundamental of Programming

## Assignment # 1

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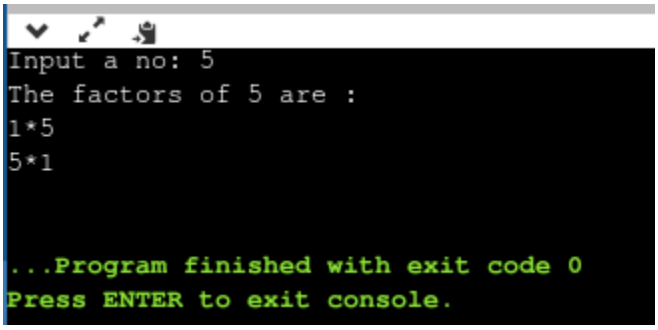
**Q1) Write a C++ program to display factors of a number using for loops.**

```
#include <iostream>
```

```
using namespace std;
int main(){
    int number;
    cout << "Input a no: ";
    cin >> number;
    cout << "The factors of "<<num<<" are :"<<endl;
    for(int i=1;i<=number;i++){
        if (number % i == 0){
                cout << i << "*" << num/i << endl;
        }
    }
    return 0;
}
```

Example Output:




**Q2) Write output to the following code.**

```
#include <iostream>

int main(){
        int x=5;
        iny y=5;

        if (x==5){
                if (y==5){
                        std::cout<<"x is 5 and y is 10"<<std::endl;
                }
        else{
                std::cout<<"x is nor 5"<<std::endl;
        }
        return 0
}
```

Output:

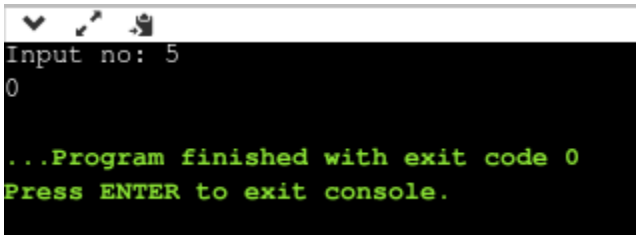
X is 5 and y is 10

**Q3) Write a C++ program, take an integer value from user and check if it's greater than 10 and less than equal to 20. Print 1 if yes and print 0 if no. Use appropriate datatype for output**

```
#include <iostream>
using namespace std;
int main(){
```

```
        int num;
        bool flag;
        cout << "Input no: ";
        cin >> num;
        if (num > 10 && num <= 20){
                flag = true;
        }
        else{
                flag =false;
        }
        cout << flag;
        return 0;
}
```

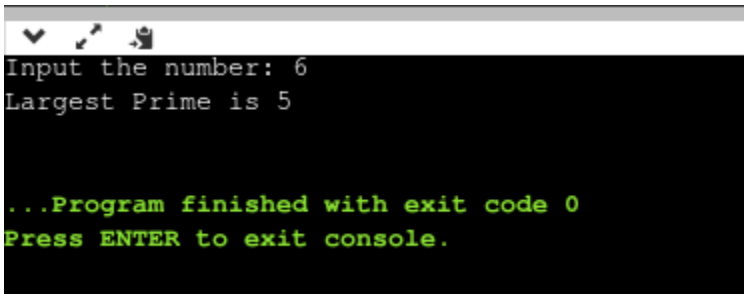
Example Output:




**Q4) 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.**

```
#include <iostream>
using namespace std;
int main(){
	int num, i;
	bool value;
	cout<<"Input the number: ";
	cin>>num;
	while (num>=2){
		i=2;
		value=false;
		while(i<num){
			if(num%i==0){
				value=true;
				break;
			}
			i++;
		}
		if(value==false){
			cout<<"Largest Prime is "<<num<<endl;
			break;
		}
		num--;
	}
	return 0;
}
```

Example Output:

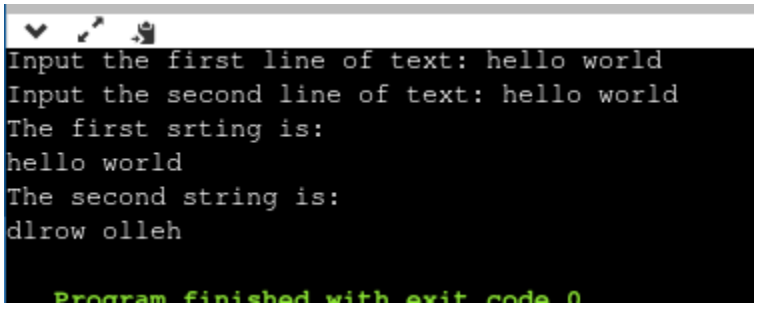



**Q5) Write a C++ program, take two strings as input from user and check if both strings are equal or not. If they are equal make**

**them unequal by rotating string. e.g., Hello is turned into olleH etc.**

```
#include <iostream>
#include <limits>
using namespace std;
int main(){
	char a[25], b[25];
	cout<<"Input the first line of text: ";
	cin.get(a, 25);
	cin.ignore(numeric_limits<streamsize>::max(), '\n');
	cout<<"Input the second line of text: ";
	cin.get(b, 25);
	cout<<"The first srting is: \n"<<a<<endl;
	cout<<"The second string is: \n";
	for (int i=24; i>=0; i--){
		if (a[i]==b[i]){
			cout<<b[i];
		}
	}
	return 0;
}
```

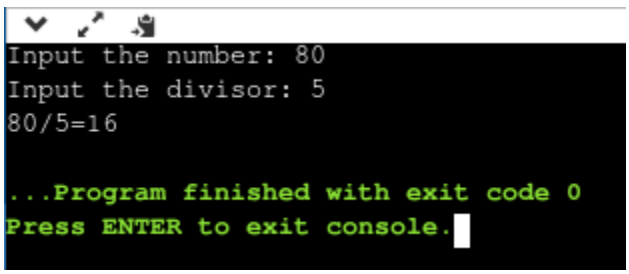
Example output:



**Q6) Perform division in C++ without / using for loops. You can use / only to display the final results. Your dividend must be greater than divisor.**

```
#include <iostream>
using namespace std;
int main(){
	int num, divisor, ans;
	cout<<"Input the number: ";
	cin>>num;
	cout<<"Input the divisor: ";
	cin>>divisor;
	for (ans=1; ans<=num; ans++){
		if(divisor*ans==num){
			cout<<num<<"/"<<divisor<<"="<<ans;
			break;
		}
	}
	return 0;
}
```

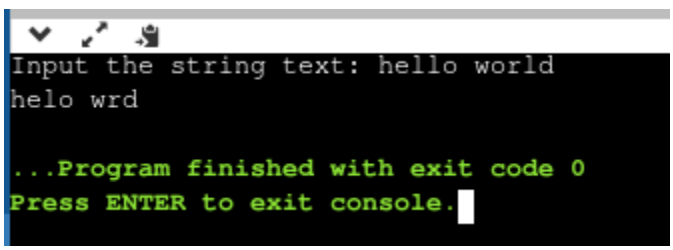
Example Output:



**Q7) 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.**

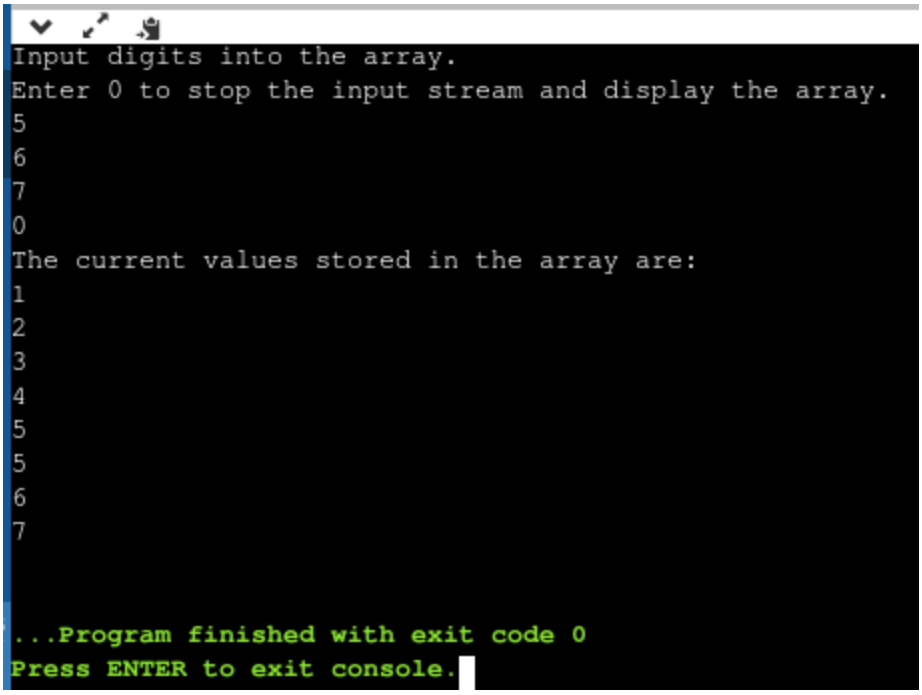
```
#include <iostream>
#include <string>
using namespace std;
int main(){
	string a;
	int l;
	cout<<"Input the string text: ";
	getline(cin, a);
	l= a.length();
	for (int i=0; i<=l; i++){
		for (int j=0; j<=l; j++){
			if (tolower(a[i])==tolower(a[j]) && i!=j){
				a.erase(j, 1);
				j--;
				l=a.length();
			}
		}
	}
	cout<<a;
	return 0;
}
```

Example Output:



## Q8) Suppose an integer array a[5] = {1,2,3,4,5}. Add more elements to it and display them in C++

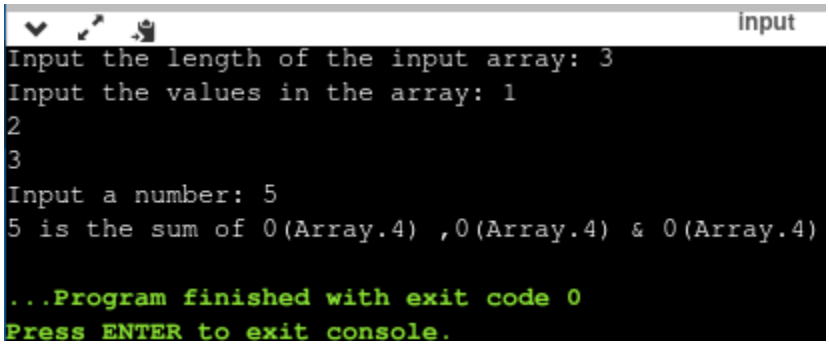
```
#include <iostream>
using namespace std;
int main(){
	int a[50]={1,2,3,4,5};
	cout<<"Input digits into the array. \n"
		<<"Enter 0 to stop the input stream and display the array. \n";
	for (int i=5; i<=49; i++){
		cin>>a[i];
		if (a[i]==0){
			break;
		}
	}
	cout<<"The current values stored in the array are: \n";
	for (int j=0; j<=49; j++){
		if (a[j]==0){
		break;
		}
		cout<<a[j]<<endl;
	}
	return 0;
}
```




**Q9) Given an integer array and an integer X. Find if there's a triplet in the array which sums up to the given integer X.**

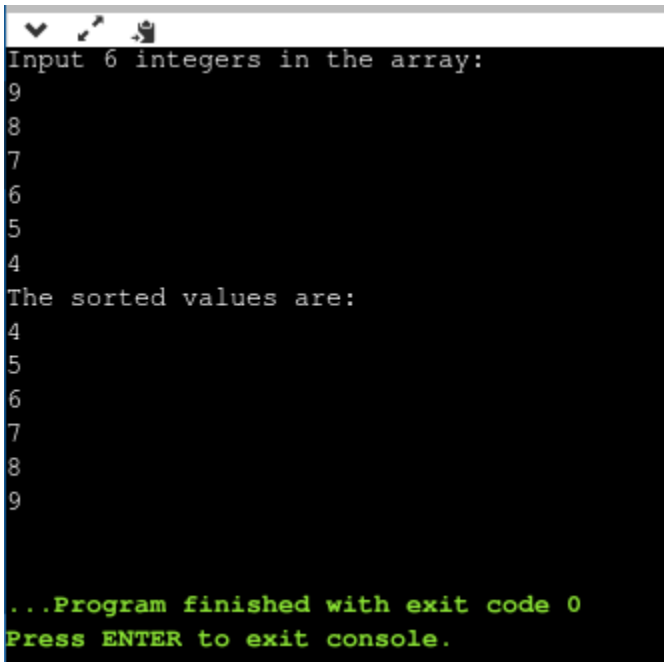
```
#include <iostream>
using namespace std;
int main(){
	int length, a[length], num, j, k, l;
	bool value=false;
	cout<<"Input the length of the input array: ";
	cin>>length;
	cout<<"Input the values in the array: ";
	for (int i=0; i<length; i++){
		cin>> a[i];
	}
	cout<<"Input a number: ";
	cin>>num;
	for(j=0; j<length; j++){
		for(k=j+1; k<length; k++){
			for (l=k+1; l<length; l++){
				if (a[j]+a[k]+a[l]==num){
					value=true;
```

```
                                        break;
                                    }
                                }
                        if(value==true){
                                break;
                        }
                        }
                if(value==true){
                        break;
                }
                }
                cout<<num<<" is the sum of "<<a[j]<<"(Array."<<j+1<<") ,"
                                                        <<a[k]<<"(Array."<<k+1<<") & "
                                                        <<a[l]<<"(Array."<<l+1<<")";
                return 0;
}
```



**Q10) Implement Bubble Sort on an array of 6 integers.**

```
#include <iostream>
using namespace std;
int main(){
	int a[6];
	cout<<"Input 6 integers in the array: \n";
	for (int i=0; i<=5; i++){
		cin>>a[i];
	}
	for(int j=0; j<=5; j++){
		for (int k=0; k<=5; k++){
			if (a[k]>a[k+1]){
				swap(a[k], a[k+1]);
			}
		}
	}
	cout<<"The sorted values are: \n";
	for (int l=0; l<=5; l++){
		cout<<a[l]<<"\n";
	}
return 0;
}
```


Input 6 integers in the array:
9
8
7
6
5
4
The sorted values are:
4
5
6
7
8
9
...Program finished with exit code 0
Press ENTER to exit console.