NUST

NATIONAL UNIVERSITY
OF SCIENCES & TECHNOLOGY

ASSIGNMENT 01

FOP

NAME: Muhammad Amaan Raza

CMS ID: 465416

CLASS: ME -15 C

Q 01 Write a C++ program to display factors of a number using for loops.

CODE:

```
#include<iostream>

using namespace std;

int main() {

	int num,factor;

	cout<<"ENTER THE NUMBER: ";

	cin>>num;

	cout<<"THE FACTORS OF "<<num<<" ARE: "<<endl;

	for(int i=1;i<=num;i++){

		if(num%i==0){

			cout<<i<<",";

		}

			else

			{

				continue;

			}

		}

	return 0;

}
```

RESULT:

```
ENTER THE NUMBER: 56
THE FACTORS OF 56 ARE:
1,2,4,7,8,14,28,56,
--------------------------------
Process exited after 6.535 seconds with return value 0
Press any key to continue . . .
```

Q 02 Write output to the following code.

```
#include <iostream>

int main() {
   int x = 5;
   int y = 10;

   if (x == 5)
      if (y == 10)
         std::cout << "x is 5 and y is 10" << std::endl;
   else
      std::cout << "x is not 5" << std::endl;

   return 0;
}
```

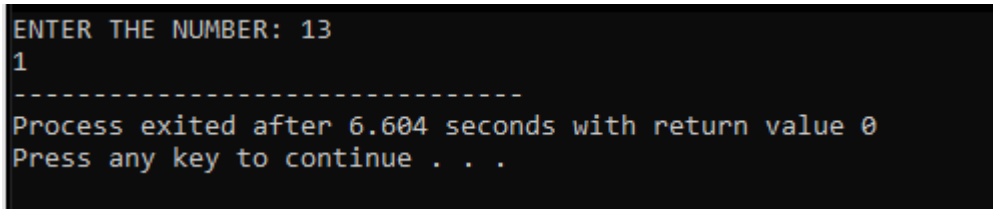
The output of the above code will be “x is 5 and y is 10”.

Q 03 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.

CODE:

```
#include<iostream>

using namespace std;

int main() {
        int num;
        cout<<"ENTER THE NUMBER: ";
        cin>>num;
        if(num>10&&num<=20){
                cout<<"1";
        }
        else
        {
                cout<<"0";
        }
        return 0;
}
```

RESULT:



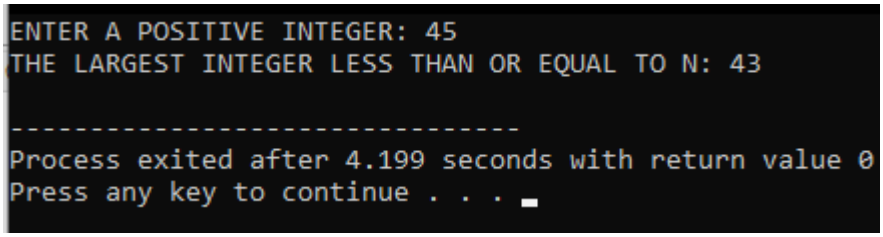
Q 04 Write a C++ program that uses a while loop to find the largest prime number less than a given positive integer N. Your program should take the value of N as input from the user and then find the largest prime number less than or equal to N. You are not allowed to use any library or pre-existing functions to check for prime numbers.

CODE:

```
#include<iostream>

using namespace std;

int main() {

	int N;

	cout<<"ENTER A POSITIVE INTEGER: ";

	cin>>N;

	while(N>1){

		int i;

		for( i=2;i*i<=N;i++){

			if(N%i==0){

				break;

			}

		}

		if(i*i>N){

			cout<<"THE LARGEST INTEGER LESS THAN OR EQUAL TO N:
"<<N<<endl;

			break;
```

```
        }
        N--;
    }
    return 0;
}
```

RESULT:



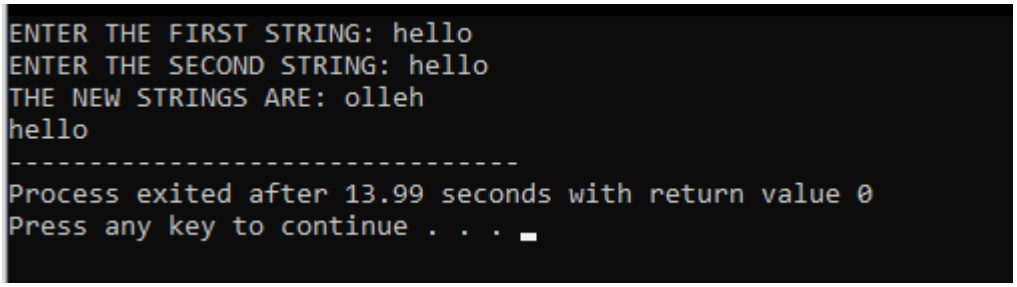
Q 05 Write a C++ program, take two string as input from user and check if both strings are equal or not. If they are equal make them unequal by rotating string. e.g., Hello is turned into olleH etc.

CODE:

```
#include<iostream>
#include<algorithm>
using namespace std;
int main() {
    string a,b ;
    cout<<"ENTER THE FIRST STRING: ";
    cin>>a;
    cout<<"ENTER THE SECOND STRING: ";
    cin>>b;
    if(a==b){
        reverse(a.begin(),a.end());
    }
```

```
    cout<<"THE NEW STRINGS ARE: ";
    cout<<a<<endl;
    cout<<b;
    return 0;
}
```

RESULT:



Q 06 Perform division in C++ without / using for loops. You can use / only to display the final results. Your dividend must be greater than divisor.

CODE:

```
#include<iostream>
using namespace std;
int main() {
    int num;
    cout<<"ENTER THE NUMBER: ";
    cin>>num;
    int x,y=0;
    cout<<"ENTER THE DIVISOR: ";
    cin>>x;
    while(num>=x){
        num-=x;
        y++;
```

```
        }
        cout<<"THE ANSWER IS: "<<y;
        return 0;
}
```

RESULT:

```
ENTER THE NUMBER: 15
ENTER THE DIVISOR: 3
THE ANSWER IS: 5
--------------------------------
Process exited after 6.455 seconds with return value 0
Press any key to continue . . .
```

Q 07 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.

CODE:

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


int main() {
   char str[100];
   cout<<"Enter a string: ";
   cin>>str;
   int i=0;
   for (int j=0;str[j]!='\0';j++) {
      char c = str[j];
            bool isDuplicate = false;
      for (int k = 0; k < i; k++) {
         if (str[k] == c) {
            isDuplicate = true;
```

```
            break;
        }
    }
    if (!isDuplicate) {
        str[i++] = c;
    }
  }
        str[i] = '\0';
  cout << "The string after removing duplicates is: " << str << endl;
        return 0;
}
```

RESULT:

```
Enter a string: ZEXRCTVYBUJNKMWREF
The string after removing duplicates is: ZEXRCTVYBUJNKMWF

--------------------------------
Process exited after 10.52 seconds with return value 0
Press any key to continue . . .
```

Q 08 Suppose an integer array a[5] = {1,2,3,4,5}. Add more elements to it and display them in C++.

CODE:

```
#include<iostream>
using namespace std;
int main() {
        int array[10]={1,2,3,4,5};
        cout<<"THE INITIAL VALUES OF ARRAY ARE: "<<endl;
        for(int i=0;i<=4;i++){
                cout<<array[i]<<",";
        }
```

```
	cout<<endl;
	cout<<"ENTER 5 NEW NUMBERS: "<<endl;
	for(int j=5;j<=9;j++){
		cin>>array[j];
	}
	cout<<"ALL THE NUMBERS IN THE ARRAY ARE: "<<endl;
	for(int k=0;k<=9;k++){
		cout<<array[k]<<",";
	}
	return 0;
}
```

RESULT:

```
THE INITIAL VALUES OF ARRAY ARE:
1,2,3,4,5,
ENTER 5 NEW NUMBERS:
45
34
23
67
12
ALL THE NUMBERS IN THE ARRAY ARE:
1,2,3,4,5,45,34,23,67,12,
--------------------------------
Process exited after 10.92 seconds with return value 0
Press any key to continue . . .
```

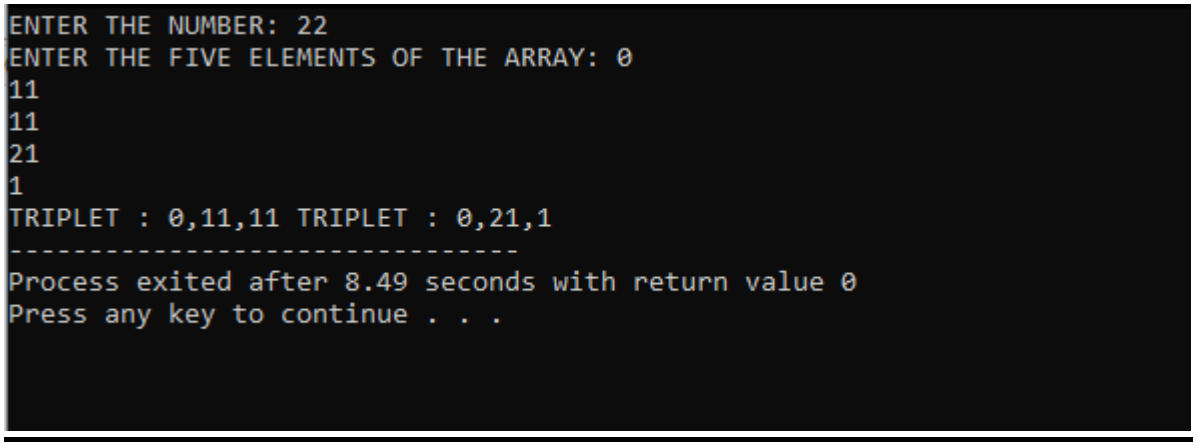
Q 09 Given an integer array and an integer X. Find if there's a triplet in the array which sums up to the given integer X.

CODE:

```
#include<iostream>
using namespace std;
int main() {
	int array[5],X;
```

```
        cout<<"ENTER THE NUMBER: ";
        cin>>X;
        cout<<"ENTER THE FIVE ELEMENTS OF THE ARRAY: ";
        for(int i=0;i<=4;i++){
                cin>>array[i];
        }
        for(int i=0;i<5-2;i++){
                for(int j=i+1;j<5-1;j++){
                        for(int k=j+1;k<5;k++){
                                if(array[i]+array[j]+array[k]==X){
                                        cout<<"TRIPLET FOUND:
"<<array[i]<<","<<array[j]<<","<<array[k];
                                        break;
                        }
                        }
                }
        }
        return 0;
}
```

RESULT:



Q 10 Implement Bubble Sort on an array of 6 integers.

CODE:

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

int main() {
   int array[6];

   cout << "Enter 6 integers for the array:" << endl;
   for (int i=0;i<6; i++) {
      cin >> array[i];
   }

   int temp;
   for (int i=0;i<5; i++) {
      for (int j=0; j<5-i; j++) {
         if (array[j]>array[j+1]) {
            temp=array[j];
            array[j]=array[j + 1];
            array[j + 1]=temp;
         }
      }
   }

   cout << "Sorted array: ";
```

```
    for (int i = 0; i < 6; i++) {
        cout<<array[i]<< ",";
    }
 return 0;
}
```

RESULT: