NATIONAL UNIVERSITY OF SCIENCES AND TEHNOLOGY

CS-114-FUNDAMENTAL OF PROGRAMING

ASSIGNMENT # 1

- **NAME:** Muhammad Uzair
- **CLASS:** ME 15
- **SECTION:** B
- **CMS ID:** 466092

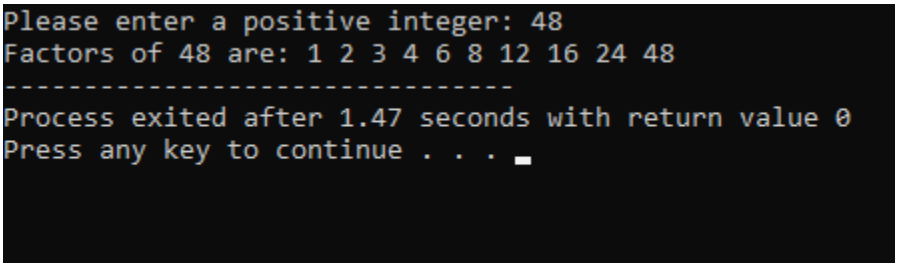
TASK # 1

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

CODE:

```
#include <iostream>

using namespace std;

int main(){

int num;

cout<<"Please enter a positive integer: ";

cin>>num;

if(num<=0){

cout<<"Please enter a positive integer.";

}

cout<<"Factors of "<<num<<" are: ";

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

if(num%i==0){

cout<<i<<" ";

}

}

return 0;

}
```

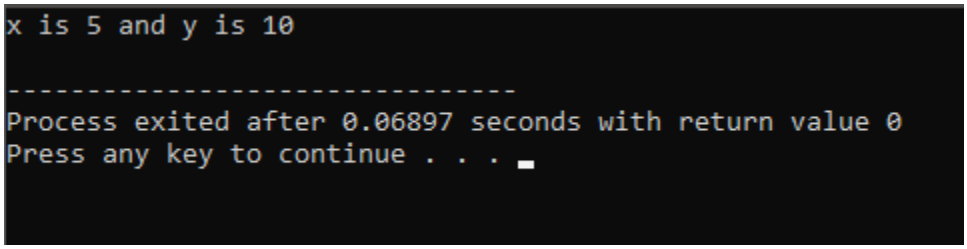
RESULT:



TASK # 2

Write output to the code.

OUTPUT:



TASK # 3

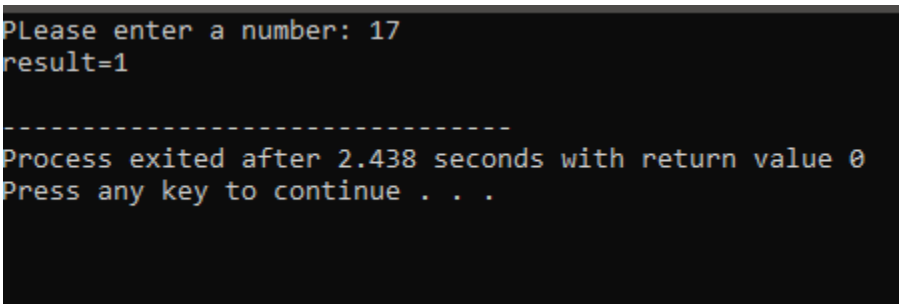
Write a C++ program, take an integer value from user and check if it's greater than 10 and less than equal to 20. Print 1 if yes and print 0 if no. Use appropriate datatype for output.

CODE:

```
#include <iostream>

using namespace std;

int main(){

int num;

cout<<"PLease enter a number: ";

cin>>num;

if(num>10){

if(num<=20){

cout<<"result=1"<<endl;

}

}
```

```
else{
cout<<"result=0";
}
return 0;
}
```

RESULT:



TASK # 4

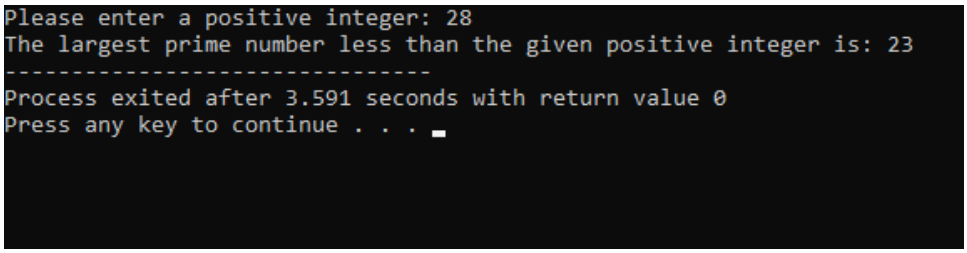
Write a C++ program that uses a while loop to find the largest prime number less than a given positive integer N. Your program should take the value of N as input from the user and then find the largest prime number less than or equal to N. You are not allowed to use any library or pre-existing functions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

CODE:

```
#include <iostream>
using namespace std;
int main(){
int num;
int i;
int count=1;
cout<<"Please enter a positive integer: ";
cin>>num;
```

```
if(num<=0){
cout<<"Please enter a positive integer.";
}
cout<<"The largest prime number less than the given positive integer is: ";
i=num-1;
while(i>=2){
count=1;
int j=2;
while(j*j<=i){
if(i%j==0){
count=0;
break;
}
j++;
}

if(count==1){
cout<<i<<" ";
break;
}
--i;
}
return 0;
}
```

RESULT:



TASK # 9

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.

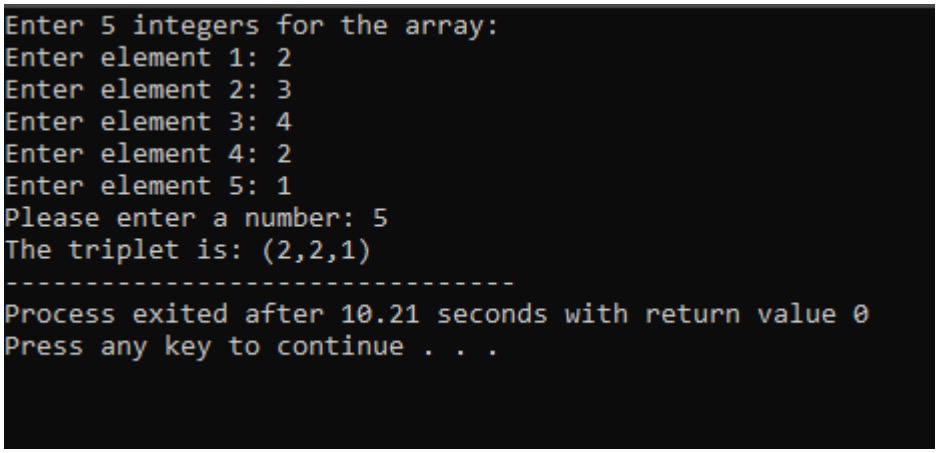
CODE:

```
#include <iostream>


using namespace std;


int main(){


int c,sum,find=0;


const int arraySize = 5;
   int array[arraySize];


   cout << "Enter " << arraySize << " integers for the array:" << endl;
   for (int i = 0; i < arraySize; ++i) {
      cout << "Enter element " << i + 1 << ": ";
      cin >> array[i];
   }


cout<<"Please enter a number: ";
```

```
cin>>sum;

for(int i=0;i<5;i++){

for(int j=j+1;j<5;j++){

for(int k=j+1;k<5;k++){

c=array[i]+array[j]+array[k];

if(c==sum){

cout<<"The triplet is: "<<"("<<array[i]<<","<<array[j]<<","<<array[k]<<")";

find=1;

}

}

}

}

if(find==0){

cout<<"Sorry, no triplet found.";
```

```
}

return 0;

}
```

RESULT:



TASK # 10

Implement Bubble Sort on an array of 6 integers.

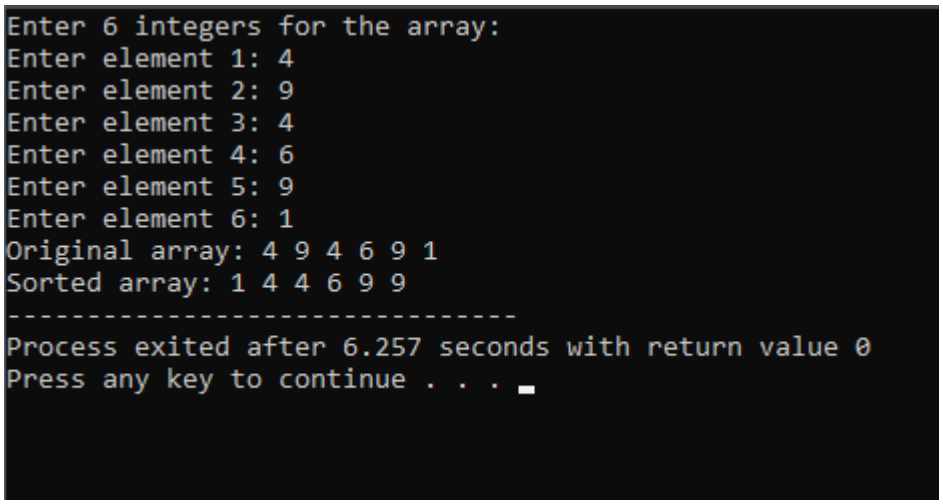
CODE:

```
#include <iostream>

using namespace std;

int main() {
    const int maxSize = 6; // Maximum size of the array
    int array[maxSize];
```

```
cout << "Enter " << maxSize << " integers for the array:" << endl;

for (int i = 0; i < maxSize; ++i) {
   cout << "Enter element " << i + 1 << ": ";
   cin >> array[i];
}

cout << "Original array: ";

for (int k = 0; k < maxSize; ++k) {
   cout << array[k] << " ";
}

cout << endl;

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

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

```
    for (int k = 0; k < maxSize; ++k) {
        cout << array[k] << " ";
    }

    return 0;
}
```

RESULT:



TASK # 5

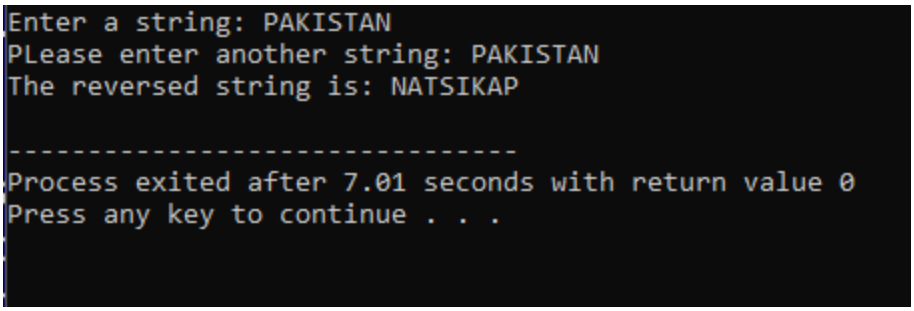
Write a C++ program, take two string as input from user and check if both strings are equal or not. If they are equal make them unequal by rotating string. e.g., Hello is turned into olleH etc.

CODE:

```
#include <iostream>

using namespace std;

int main(){
```

```
string str,str2;
cout << "Enter a string: ";
cin >> str;
cout<<"PLease enter another string: ";
cin>>str2;
if(str!=str2){
cout<<"Both strings are unequal.";
}
else{

string reversedString = "";
for (int i = str.length() - 1; i >= 0; i--) {
  reversedString += str[i];
}

cout << "The reversed string is: " << reversedString << endl;
}
return 0;
}
```

RESULT:



TASK # 5

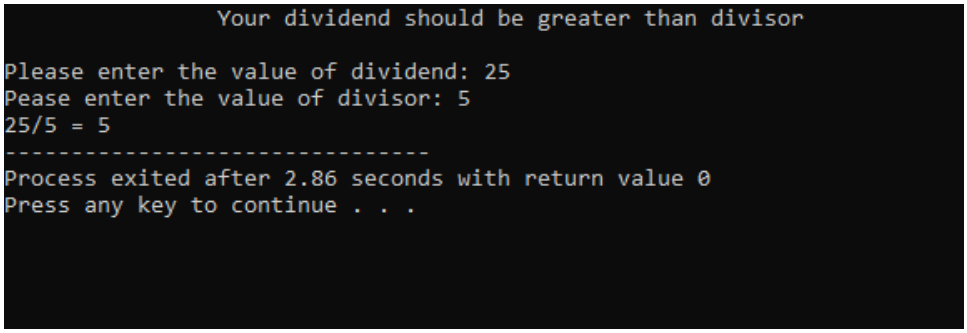
Perform division in C++ without / using for loops. You can use / only to display the final results. Your dividend must be greater than divisor.

CODE:

```
#include <iostream>

using namespace std;

int main(){

int remainder=0;

int divisor,quotient=0,dividend;

cout<<"\t\tYour dividend should be greater than divisor \n\n";

cout<<"Please enter the value of dividend: ";

cin>>dividend;

cout<<"Pease enter the value of divisor: ";

cin>>divisor;

remainder=dividend;

if(dividend<divisor){

cout<<"Please enter a divisor greater than divisor";

}

else{

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

remainder=remainder-divisor;
```

```
if(remainder<divisor){
quotient=i;
break;
}


}



}
cout<<dividend<<"/"<<divisor<<" = "<<quotient;
return 0;
}
```

RESULT:



TASK # 7

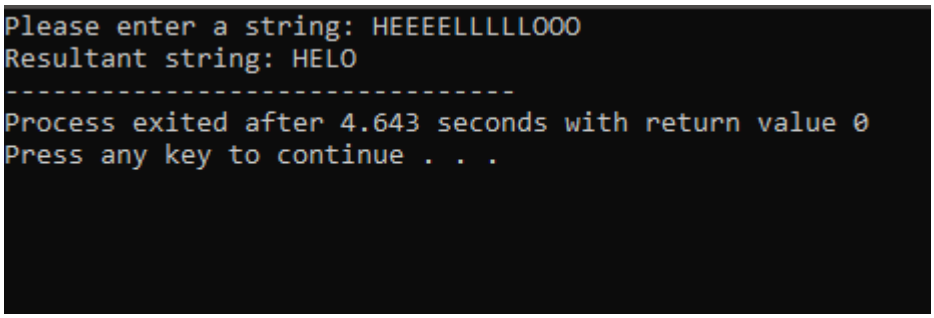
Write a C++program for a string which may contain lowercase and uppercase characters. The task is to remove all duplicate characters from the string and find the resultant string.

CODE:

```
#include <iostream>
#include<string.h>
```

```
using namespace std;

int main(){

string str,res="";

cout<<"Please enter a string: ";

getline(cin,str);

int i,j

;for( i=0;i<str.length();i++){

for( j=0;j<str.length();j++){

if(str[i]==str[j]){

break;

}

}

if(i==j){

res=res+str[i];


}

}

cout<<"Resultant string: "<<res;


}
```

RESULT:



TASK # 8

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() {
   const int originalSize = 5;
   int a[originalSize] = {1, 2, 3, 4, 5};

   cout << "Original array: ";
   for (int i = 0; i < originalSize; ++i) {
      cout << a[i] << " ";
   }

   int numAdditionalElements;
   cout << "\nEnter the number of additional elements: ";
   cin >> numAdditionalElements;

   cout << "Enter " << numAdditionalElements << " additional elements:\n";
   for (int i = originalSize; i < originalSize + numAdditionalElements; ++i) {
      cin >> a[i];
   }
```

```
    cout << "Updated array: ";
    for (int i = 0; i < originalSize + numAdditionalElements; ++i) {
        cout << a[i] << " ";
    }

    return 0;
}
```

RESULT: