NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

CS-114- FUNDAMENTAL OF PROGRAMMING

ASSIGNMENT 1

SUBMITTED BY:

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SECTION:ME-15 (C)

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SUBMITTED TO:

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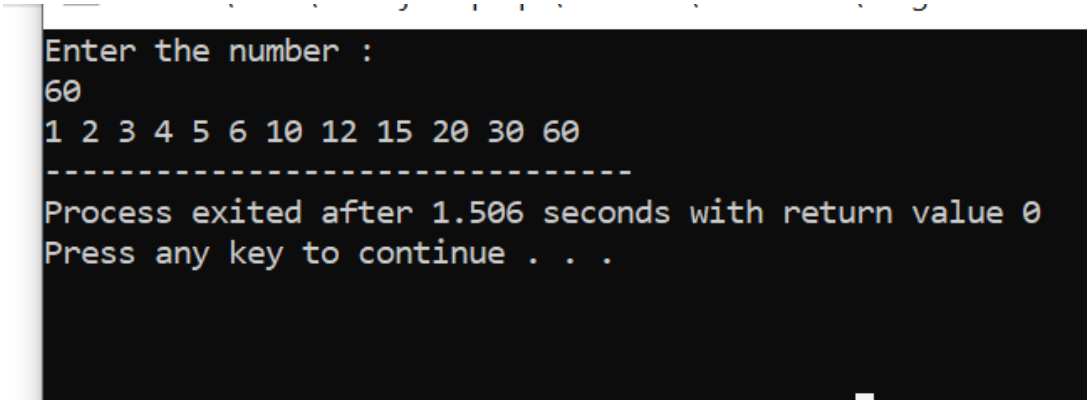
TASK 1:

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

CODE:

```cpp
#include <iostream>
using namespace std;
int main()
{
//display factors of any number including number
    int n;
    cout <<"Enter the number :"<<endl;
    cin>>n;
    for (int i = 1; i<=n; i++){
        //factors are basically those numbers which completely divide given number
        if (n%i==0)
        cout <<i<<" "; //output
    }
    return 0;
}
```

RESULT:



TASK 2:

Output of given code

CODE:

```cpp
#include <iostream>
using namespace std;
int main() {
 //it is given code we have only show output of this code
 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;
}
```

RESULT:

```
x is 5 and y is 10

--------------------------------
Process exited after 0.05805 seconds with return value 0
Press any key to continue . . .
```

TASK 3:

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

CODE:

```cpp
#include <iostream>
using namespace std;
int main ()
{
    //print 1 if user enter number is less than or equal to 20 and greater than 10 otherwise print 0
    int num;
    cout<<"Enter value of integer :";
    cin>>num;
    if (num>10 && num<=20)
    cout <<" 1 ";
    else
    cout <<" 0 ";
    return 0;
}
```

RESULT:

```
Enter value of integer :14
 1
--------------------------------
Process exited after 1.877 seconds with return value 0
Press any key to continue . . .
```

TASK 6:

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:

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

int main()
{    //perform division without loops in c++
   //declaration
    int  divisor, dividend;
    int quotient, remainder;
//ask user to enter dividend and divisor and make sure your dividend must be greater
    cout << "Enter dividend: ";
    cin >> dividend;

    cout << "Enter divisor: ";
    cin >> divisor;

    quotient = dividend / divisor;
    remainder = dividend % divisor;
//output
    cout << "Quotient = " << quotient << endl;
    cout << "Remainder = " << remainder;

    return 0;
}
```

```
Enter dividend: 57
Enter divisor: 14
Quotient = 4
Remainder = 1
--------------------------------
Process exited after 4.734 seconds with return value 0
Press any key to continue . . .
```

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.

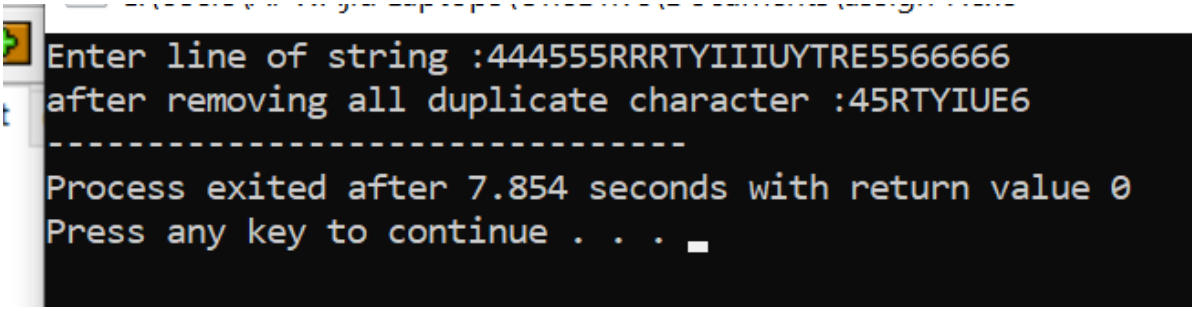
CODE:

```
#include <iostream>

using namespace std;
int main ()
{
// code to remove all duplicate characters or numbers in a given string
    string str, result ; //declare string as str and final result
    cout<<"Enter line of 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){
                result+=str[i];
            }
    }
    cout<<"after removing all duplicate character :"<<result;
    return 0;

    }
```

RESULT:



TASK 10:

Implement Bubble Sort on an array of 6 integers.

CODE:

```cpp
#include <iostream>
using namespace std;
int main () {
    //code for bubble sort on an array of 6 integers
    int n = 6; //initialize n with 6
    int arr[6];
    for (int i = 0; i<6; i++){
    cout<<"Enter the array which you want to sort :";
        cin>>arr[i];
    }
    int count = 1;
    while(count<6){
        for (int i = 0; i<6-count; i++){
        if (arr[i]>arr[i+1]){
            int y =arr[i]; //only declare y for swaping
            arr[i]=arr[i+1];
            arr[i+1]=y;
        }
    }
    count++ ;
}
for(int i=0;i<6;i++){
    cout<<arr[i]<<" "; // output
}
cout<<endl;
return 0;
}
```

RESULT:

```
Enter the array which you want to sort :456
Enter the array which you want to sort :34567
Enter the array which you want to sort :234
Enter the array which you want to sort :567
Enter the array which you want to sort :345
Enter the array which you want to sort :24
24 234 345 456 567 34567

--------------------------------
Process exited after 7.601 seconds with return value 0
Press any key to continue . . .
```

TASK 8:

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

CODE:

```cpp
#include <iostream>
using namespace std;
int main() {
    int a[5] = {1, 2, 3, 4, 5}; //suppose it is original and add more in it
    cout << "Original elements of array : " << endl;
    for (int i = 0; i < 5; ++i) {
        cout << a[i] << " ";
    } cout<<endl;
// Add more elements in above array of your own size
    int n ;  // declare n for new size
    cout<<"Enter new size : ";
    cin>>n;
    int X[n];
//first print same elements in new array
    for (int i = 0; i < 5; ++i) {
        X[i] = a[i];
    }
    for (int i = 5; i < n; ++i) {
        X[i] = i + 1;
    }
    cout << "New elements of array :" << endl;
    for (int i = 0; i < n; ++i) {
        cout << X[i] << " ";
    }
      return 0;
}
```

RESULT:

```
Original elements of array :
1 2 3 4 5
Enter new size :
12
New elements of array :
1 2 3 4 5 6 7 8 9 10 11 12
--------------------------------
Process exited after 6.411 seconds with return val
Press any key to continue . . .
```

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 a[5] , n;
    bool found = false;
    cout << "Enter a number : ";
    cin >> n;
    cout << "Enter the numbers of the array : ";
    for (int i = 0; i < 5; i++)
    {
        cin >> a[i];
    }
    for (int i = 0; i < 5; i++) {
        for (int j = 0; j < 5; j++) {
        for (int l = 0; l < 5; l++) {
            if (a[i] + a[j] + a[l] == n) {
                found = true;   }
        }
    }
}
    if (!found){
        cout << "Triplet not found " << endl;
    } else {
        cout << "Triplet found ";
    }
    return 0;
}
```

RESULT:

```
Enter a number : 36
Enter the numbers of the array : 12
12
12
12
12
Triplet found
--------------------------------
Process exited after 8.982 seconds with return value
```

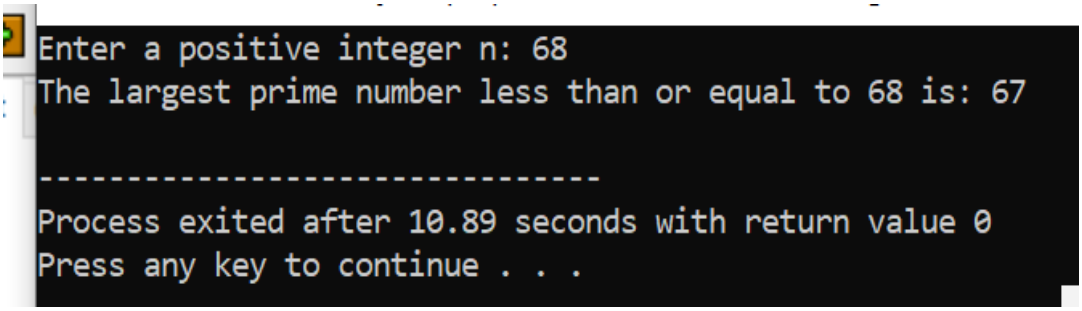
TASK 4:

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:

```cpp
#include <iostream>
using namespace std;
int main() {
    // Declare variables
    int n, largestPrime;
    bool flag = true;
    cout << "Enter a positive integer n: ";
    cin >> n;
    largestPrime = 0;
    int c = 2; // c used for count
while(c<=n) {
    flag = true;
    int i = 2;
    while (i<c&&flag==true) {
        if(c%i!=0) {flag = true;
        } else {
            flag = false;
        }
        i++;
    }
    if(flag==true) {
        largestPrime = c;
    }
    c++;
}
 // Print the result
    cout << "The largest prime number less than or equal to " << n << " is: " << largestPrime << endl;
    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>
#include<algorithm>//used for reverse function
using namespace std;

int main()
{
    string a , b;
    cout<<"Enter two string : "<<endl;
    cin >> a;
    cin >> b;
//only rotate string if they are equal
    if(a!=b) {
    cout<<a<<endl;
    cout<<b<<endl;
} else{
    if (a == b)
    {
        reverse(a.begin(), a.end());//reverses the function
    }
    cout << "After rotating : " <<a << endl;
cout<<b<<endl;
    }
    return 0;
}
```

RESULT: