



FUNDAMENTAL OF PROGRAMMING

Assignment 1

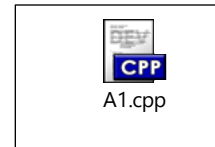
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Write a C++ program to display factors of a number using for loops.

CODE

```
#include<iostream>
using namespace std;
int main(){
    int x;
    cout<<"Enter a no= ";
    cin>>x;
    for(int y=1;y<=x;y++){
        if(x%y==0){
            cout<<y<<endl; } } }
```



OUTPUT:

A screenshot of a Windows command prompt window. The title bar shows the file path 'C:\Users\drmah\OneDrive\Des'. The command prompt displays the program's output: 'Enter a no= 9', followed by the factors '1', '3', and '9' on separate lines. Below this, it shows 'Process exited after 19.82 seconds with return value 0' and 'Press any key to continue . . . |'. The Windows taskbar is visible at the bottom, showing the Start button, search bar, and various application icons. The system tray on the right indicates the date and time as '17-Nov-2023' and '11:47 pm'.

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;  
}
```

OUTPUT:

x is 5 and y is 10

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 x;

    cout<<"Enter no= ";

    cin>>x;

    if(x>10&&x<=20){

        cout<<"1";}

    else{ cout<<"0";} }
```



OUTPUT:

A screenshot of a Windows terminal window showing the execution of a C++ program. The window title is 'C:\Users\drmah\OneDrive\Des'. The input '45' is entered, and the output '0' is displayed. The terminal also shows a message: 'Process exited after 21.63 seconds with return value 0' and 'Press any key to continue . . .'. The Windows taskbar is visible at the bottom, showing the date and time as 11:51 pm on 17-Nov-2023.

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;

bool Prime(int number) {
    if(number<=1){
        return false;}

    for(int i=2;i*i<=number;i++) {
        if(number%i==0){
            return false;} }

    return true;}

int main(){
    int x;

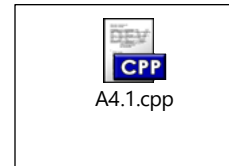
    cout<<"Enter a positive integer X: ";

    cin>>x;

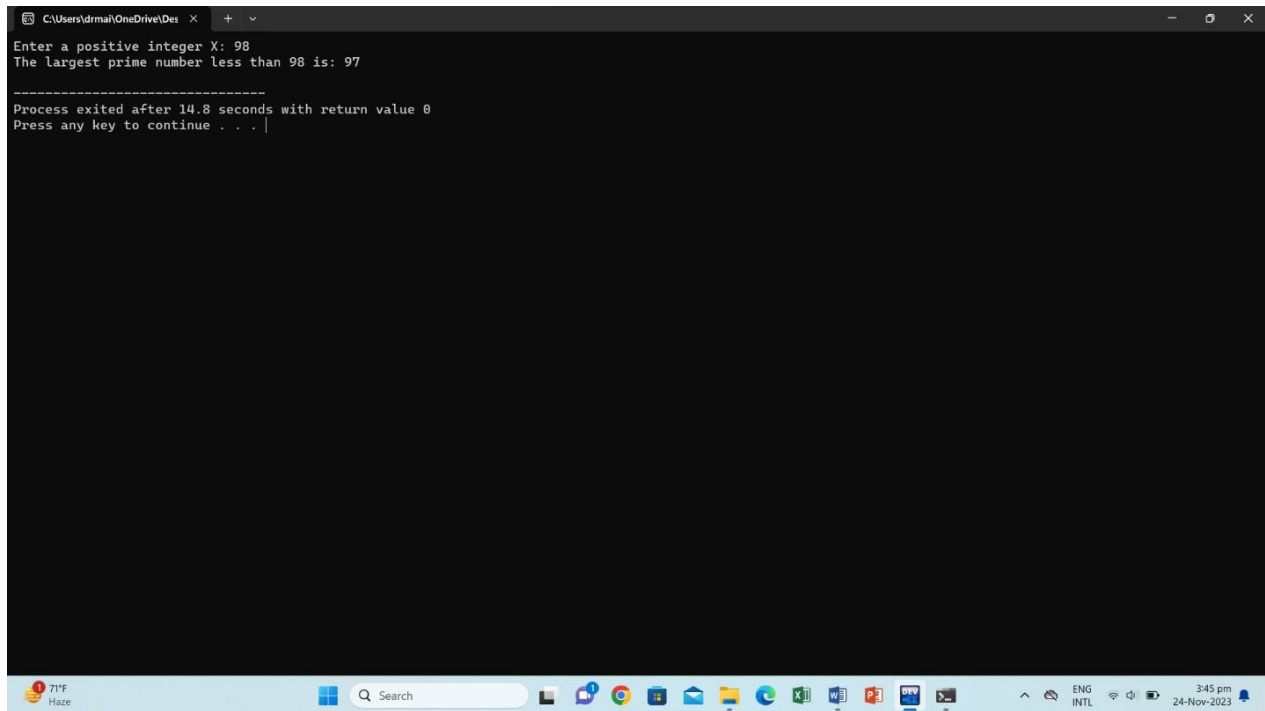
    while(x>=2){
        if(Prime(x-1)){
            cout<<"The largest prime number less than " <<x<<" is: " <<x-1<<endl;
            break;}

        x--;}

    return 0;}
```



OUTPUT:



```
C:\Users\drrmai\OneDrive\Des >
Enter a positive integer X: 98
The largest prime number less than 98 is: 97

-----
Process exited after 14.8 seconds with return value 0
Press any key to continue . . . |
```

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 <string>

using namespace std;

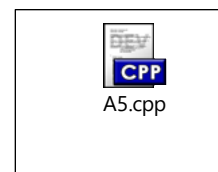
int main(){

    string str1, str2;

    cout<< "Enter the first string: ";

    getline(cin, str1);

    cout<< "Enter the second string: ";
```



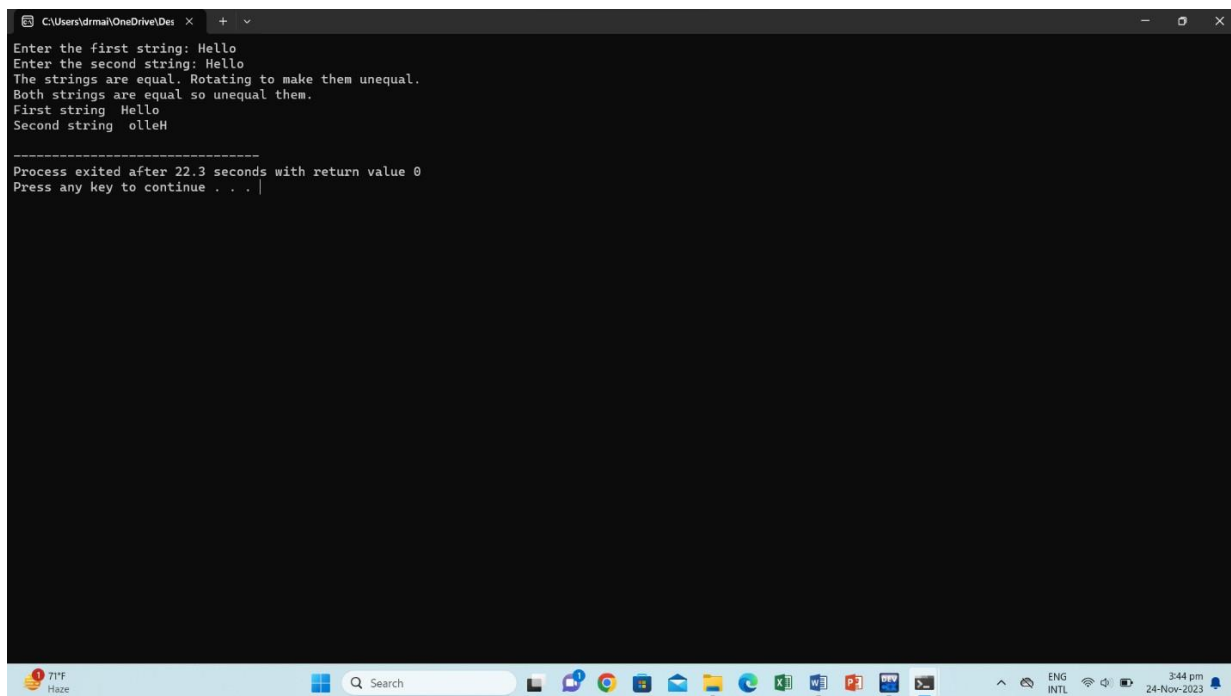
```

getline(cin, str2);
if(str1==str2){
    cout<< "The strings are equal. Rotating to make them unequal.\n";
    int length=str2.length();
    for(int i=0;i<length/2;i++) {
        swap(str2[i],str2[length-i-1]); }
    cout<<"Both strings are equal so unequal them. "<<endl;
    cout<< "First string " <<str1<<endl;
    cout<< "Second string " <<str2<<endl;
} else {
    cout<< "The strings are already unequal.\n"; }

return 0; }

```

OUTPUT:



```

C:\Users\drma\OneDrive\Des  x  +  v
Enter the first string: Hello
Enter the second string: Hello
The strings are equal. Rotating to make them unequal.
Both strings are equal so unequal them.
First string Hello
Second string olleH

-----
Process exited after 22.3 seconds with return value 0
Press any key to continue . . . |

```

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 dividend= 30;

    int divisor=5;

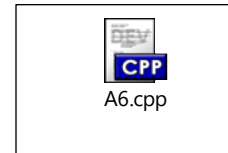
    int quotient=0;

    while(dividend>=divisor){

        dividend-=divisor;

        quotient++;}

    cout<<"Division: "<<quotient<<endl;}
```



OUTPUT:

A screenshot of a Windows command prompt window. The title bar shows the file path 'C:\Users\drmai\OneDrive\Des'. The command prompt displays the output 'Division: 6' followed by a horizontal line. Below the line, it says 'Process exited after 12.31 seconds with return value 0' and 'Press any key to continue . . .'. The Windows taskbar is visible at the bottom, showing the system clock as 11:59 pm on 17-Nov-2023.

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(){

    string str1,str2;

    cout<<"Enter the word ";

    cin>>str1;

    int j=0 , i=0;

    for( i=0; i<str1.length();i++){

        for(j=0;j<str1.length();j++){

            if(str1[i]==str1[j]){

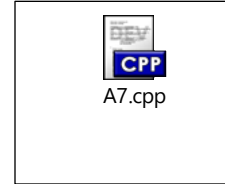
                break;} }

        if(i==j){

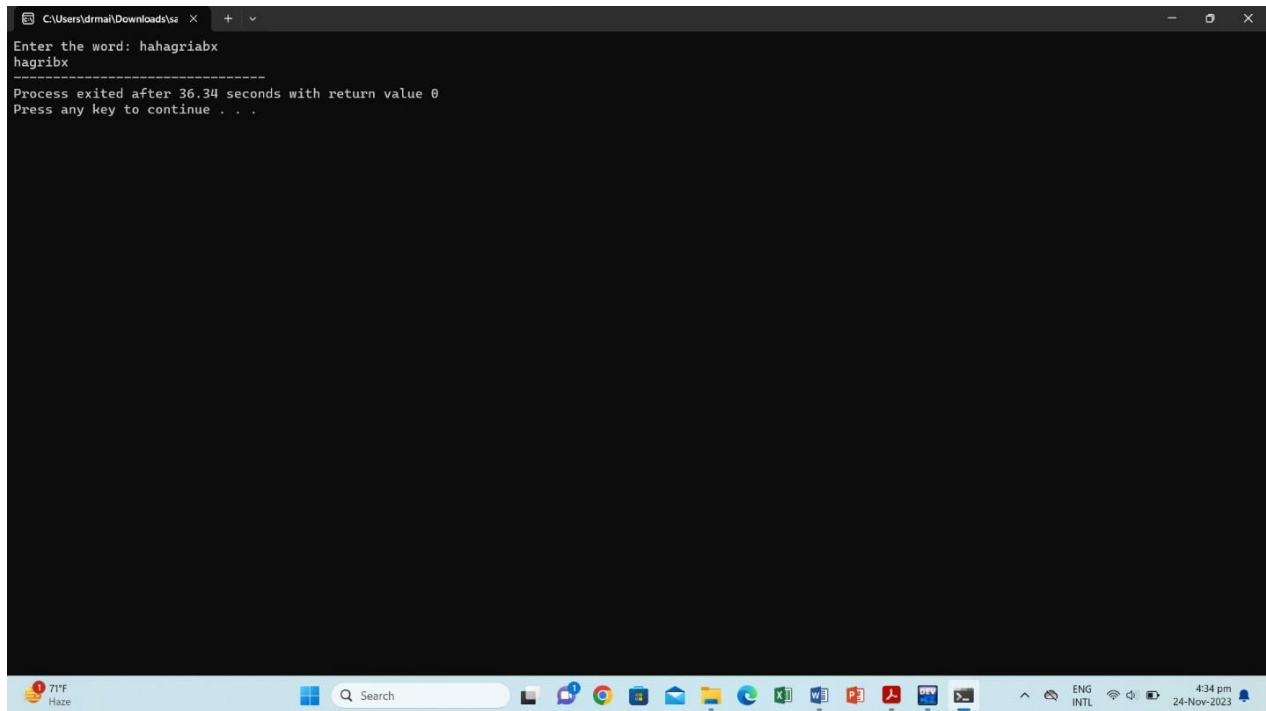
            str2+=str1[i];} }

    cout<<str2;

    return 0;}
```



OUTPUT:



A screenshot of a Windows command prompt window. The title bar shows the path 'C:\Users\drmai\Downloads\sa'. The window contains the following text: 'Enter the word: hahagriabx', 'hagriabx', a dashed line separator, 'Process exited after 36.34 seconds with return value 0', and 'Press any key to continue . . .'. The Windows taskbar is visible at the bottom, showing the time as 4:34 pm on 24-Nov-2023.

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 a[5]={1,2,3,4,5};

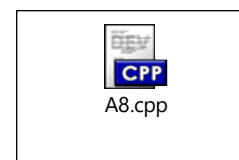
    int A[7]={1,2,3,4,5,6,7};

    for(int x=0;x<7;x++){

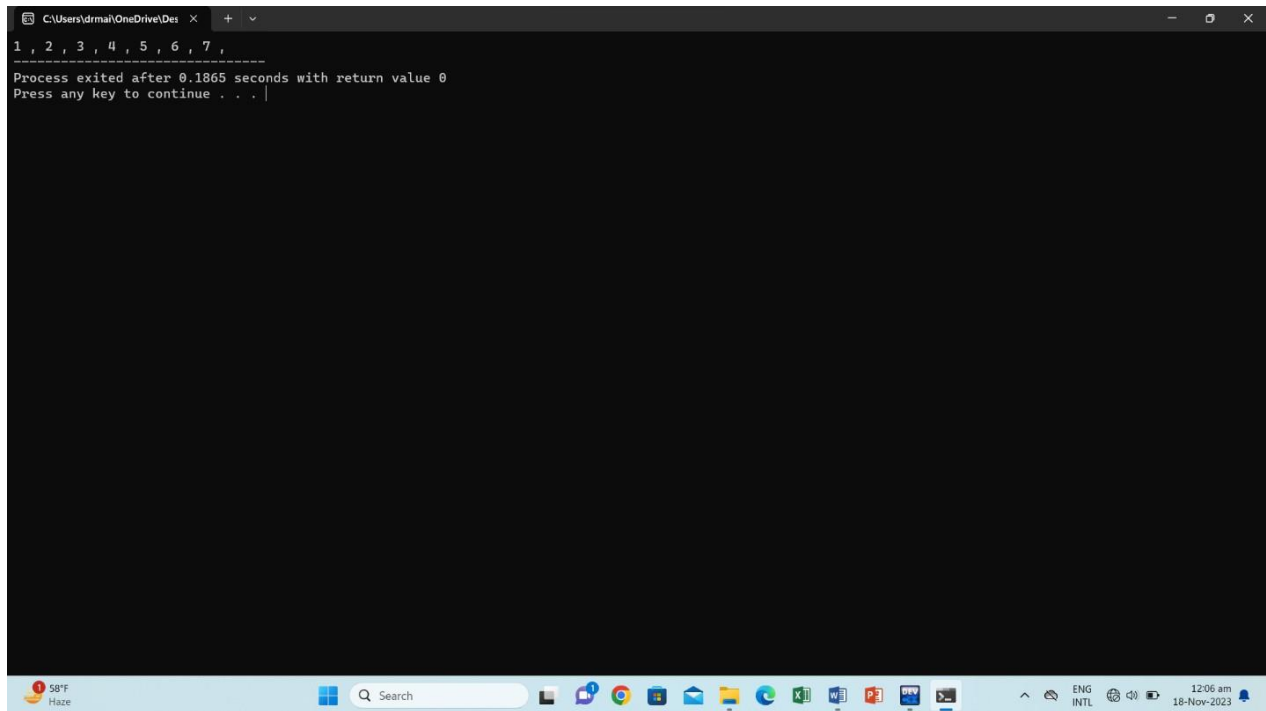
        cout<<A[x]<<" , ";

    }

}
```



OUTPUT:



```
C:\Users\drmai\OneDrive\Des
1, 2, 3, 4, 5, 6, 7,
-----
Process exited after 0.1865 seconds with return value 0
Press any key to continue . . .
```

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 num,x,y, sum;

    cout<<"Enter the number of elements: ";

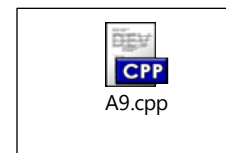
    cin>>num;

    int arr[num]={};

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

        cout<<"Array no "<<i<<": ";

        cin>>arr[i];}
```



```

cout<<"Array: ";

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

    cout<<arr[j]<<" ";}

cout<<endl;

cout<<"Enter sum answer: ";

cin>>y;

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

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

        sum = arr[i] + arr[j];

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

            sum+=arr[k];

            if(sum==y){

                cout<<"( "<<arr[i]<<" , "<<arr[j]<<" , "<<arr[k]<<" ) \n";}    } } } }

```

OUTPUT:

```

C:\Users\drmah\Downloads\tr
Enter the number of elements: 5
Array no 1: 1
Array no 2: 3
Array no 3: 6
Array no 4: 9
Array no 5: 15
Array: 1 3 6 9 15
Enter sum answer: 18
( 3 , 6 , 9)

-----
Process exited after 53.92 seconds with return value 0
Press any key to continue . . .

```

Implement Bubble Sort on an array of 6 integers.

CODE:

```
#include<iostream>

using namespace std;

int main(){

    int x=6;

    int arr[x]={};

    for (int i = 1; i<=x; i++)

    { cout<<"Enter no"<<i<<" ";

        cin>>arr[i]; }

    cout<<"Ascending order: ";

    for(int j=1;j<=x;j++)

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

        {      int swap;

            if(arr[j]>arr[k]){

                swap=arr[j];

                arr[j]=arr[k];

                arr[k]=swap; } }

        cout<<arr[j]<<" "; }

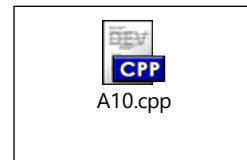
    cout<<endl;

    cout<<"Descending order: ";

    for(int j=1;j<=x;j++)

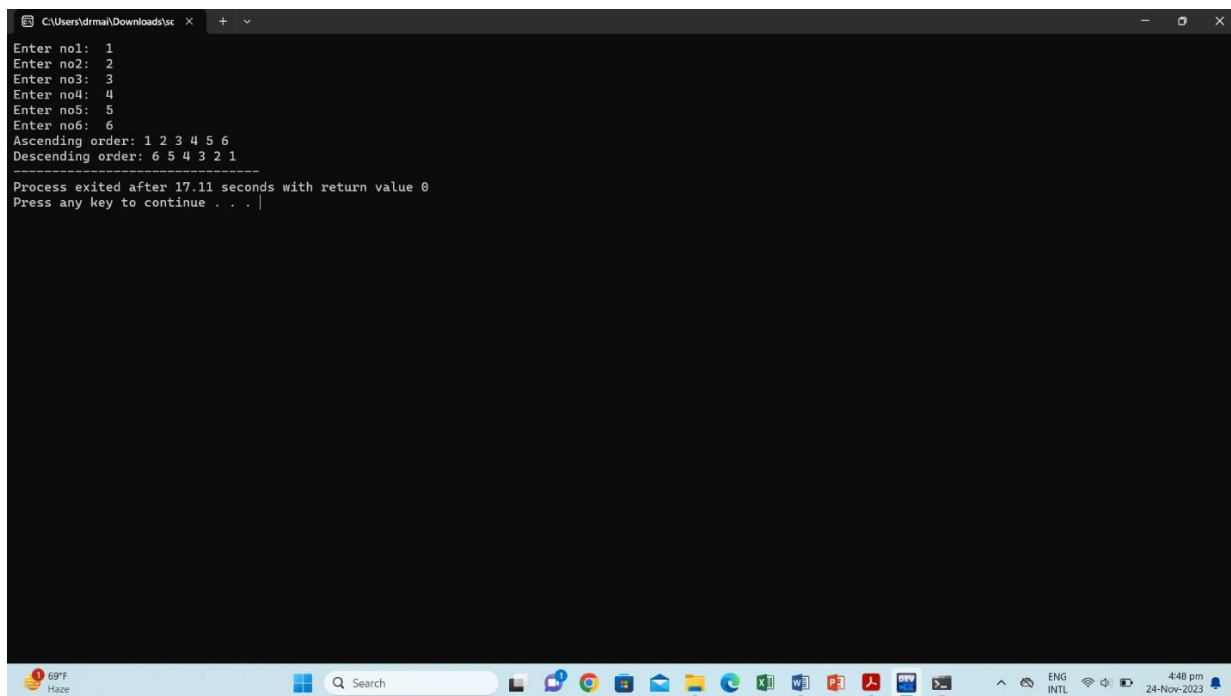
    { for(int k=j+1; k<=x; k++)

        {      int swap;
```



```
        if(arr[j]<arr[k]){  
            swap=arr[j];  
            arr[j]=arr[k];  
            arr[k]=swap;    } }  
    cout<<arr[j]<<" "; }  
  
    return 0; }
```

OUTPUT:



```
C:\Users\drman\Downloads\sc > Enter no1: 1  
Enter no2: 2  
Enter no3: 3  
Enter no4: 4  
Enter no5: 5  
Enter no6: 6  
Ascending order: 1 2 3 4 5 6  
Descending order: 6 5 4 3 2 1  
-----  
Process exited after 17.11 seconds with return value 0  
Press any key to continue . . .
```