



NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY

CS-114-FUNDAMENTAL OF PROGRAMING ASSIGNMENT # 1

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➤ **SECTION:** B

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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;

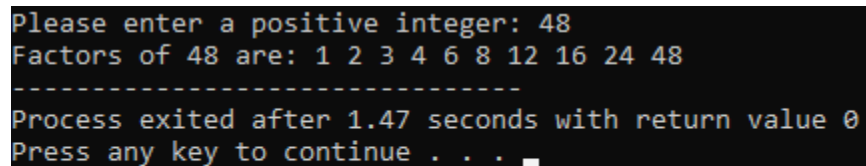
    if(num<=0){
        cout<<"Please enter a positive integer.";
    }

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

    for(int i=1;i<=num;i++){
        if(num%i==0){
            cout<<i<<" ";
        }
    }

    return 0;
}
```

RESULT:



```
Please enter a positive integer: 48
Factors of 48 are: 1 2 3 4 6 8 12 16 24 48
-----
Process exited after 1.47 seconds with return value 0
Press any key to continue . . .
```

TASK # 2

Write output to the code.

OUTPUT:

```
x is 5 and y is 10
-----
Process exited after 0.06897 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 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;

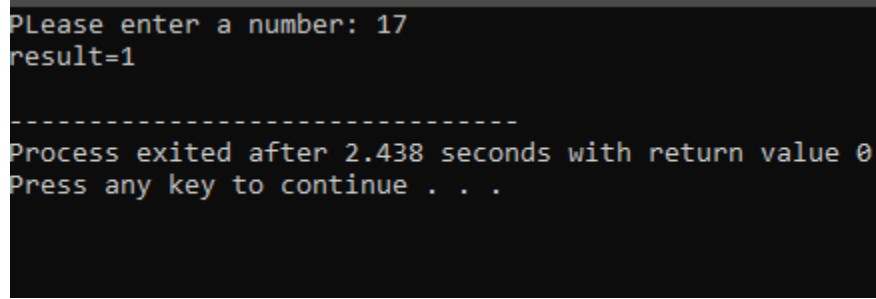
        }

    }

}
```

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

RESULT:



```
Please enter a number: 17  
result=1  
-----  
Process exited after 2.438 seconds with return value 0  
Press any key to continue . . .
```

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:

```
Please enter a positive integer: 28
The largest prime number less than the given positive integer is: 23
-----
Process exited after 3.591 seconds with return value 0
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 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:

```
Enter 5 integers for the array:
Enter element 1: 2
Enter element 2: 3
Enter element 3: 4
Enter element 4: 2
Enter element 5: 1
Please enter a number: 5
The triplet is: (2,2,1)
-----
Process exited after 10.21 seconds with return value 0
Press any key to continue . . .
```

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:

```
Enter 6 integers for the array:  
Enter element 1: 4  
Enter element 2: 9  
Enter element 3: 4  
Enter element 4: 6  
Enter element 5: 9  
Enter element 6: 1  
Original array: 4 9 4 6 9 1  
Sorted array: 1 4 4 6 9 9  
-----  
Process exited after 6.257 seconds with return value 0  
Press any key to continue . . .
```

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:

```
Enter a string: PAKISTAN
Please enter another string: PAKISTAN
The reversed string is: NATSIKAP

-----
Process exited after 7.01 seconds with return value 0
Press any key to continue . . .
```

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:

```

Your dividend should be greater than divisor

Please enter the value of dividend: 25
Pease enter the value of divisor: 5
25/5 = 5
-----
Process exited after 2.86 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>

#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:

```

Please enter a string: HEEEELLLLLOO
Resultant string: HELO
-----
Process exited after 4.643 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:

```
#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:

```
Original array: 1 2 3 4 5  
Enter the number of additional elements: 4  
Enter 4 additional elements:  
9  
8  
8  
7  
Updated array: 1 2 3 4 5 9 8 8 7  
-----  
Process exited after 6.551 seconds with return value 0  
Press any key to continue . . . _
```