NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY

PROGRAMMING FUNDAMENTALS

ASSIGNMENT# 1

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CLASS:	**ME-15**
COURSE:	**CS-114**
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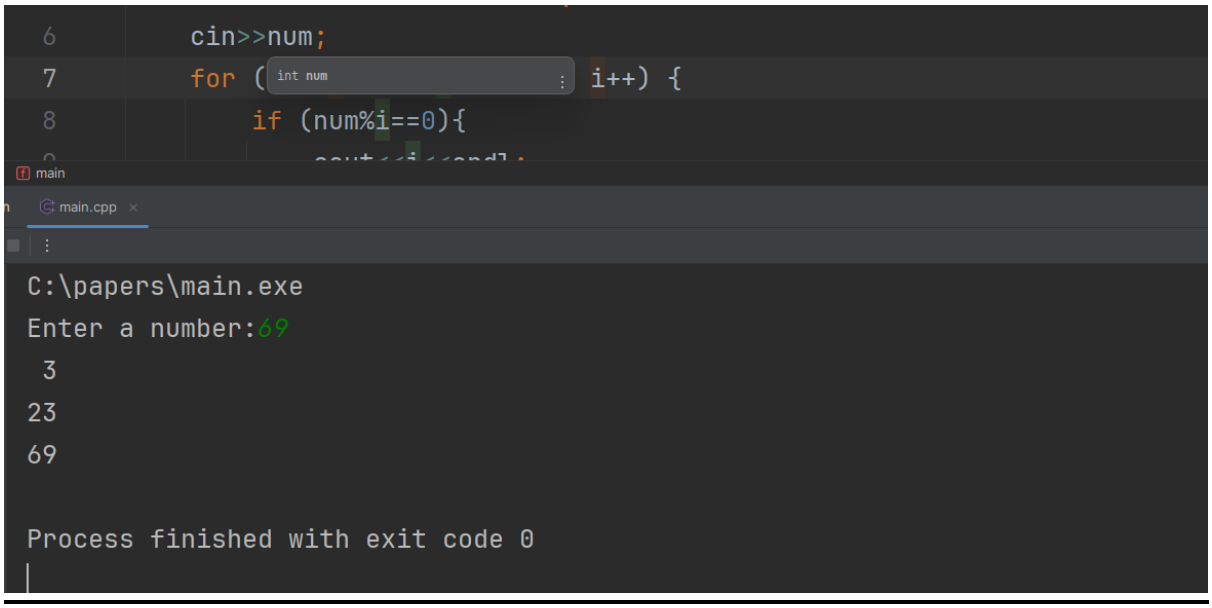
Q 1: Write a C++ program to display factors of a number using for loops.

Q 1 (solution):

```
#include <iostream>
using namespace std;
int main() {
    int num;
    cout<<"Enter a number: ";
    cin>>num;
    for (int i = 2; i <= num; i++) {
        if (num%i==0){
            cout<<i<<endl;
        }
    }
    return 0;
    }
```

Q 1(results):


cin>>num;
for (int num i++) {
if (num%i==0){
main
main.cpp
C:\papers\main.exe
Enter a number:69
3
23
69
Process finished with exit code 0

Q 2:

Ans: The result will be, **x is 5 and y is 10.**

Q 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.

Q 3 (solution):

```
#include <iostream>
using namespace std;
int main() {
    int num;
    cout<<"Enter a number:";
    cin>>num;
    if (num>10 and num<=20){
        cout<<"1";
    }else{
        cout<<"0";
    }
    return 0;
    }
```

Q 3 (result):


}else{
cout<<"0";
}
return 0;
main
main.cpp
C:\papers\main.exe
Enter a number:25
0
Process finished with exit code 0

Q 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.

Q 4 (Solution):

```
#include <iostream>
using namespace std;
int main() {
    int num, prime;
    bool isprime;
    cout << "Enter a number: ";
    cin >> num;
    while (num >= 2) {
        isprime = true;

        for (int i = 2; i * i <= num;
++i) {
            if (num % i == 0) {
                isprime = false;
                break;
            }
        }
        if (isprime == true) {
            prime = num;
            break;
        }
        --num;
    }
    cout << "The largest prime number =
"<<prime;
```

```
    return 0;
}
```

Q 4 (results):

```
7       cin >> num;
8       while (num >= 2) {
9           isprime = true;
10
11          for (int i = 2; i * i <= num; ++i) {
```

main

main.cpp

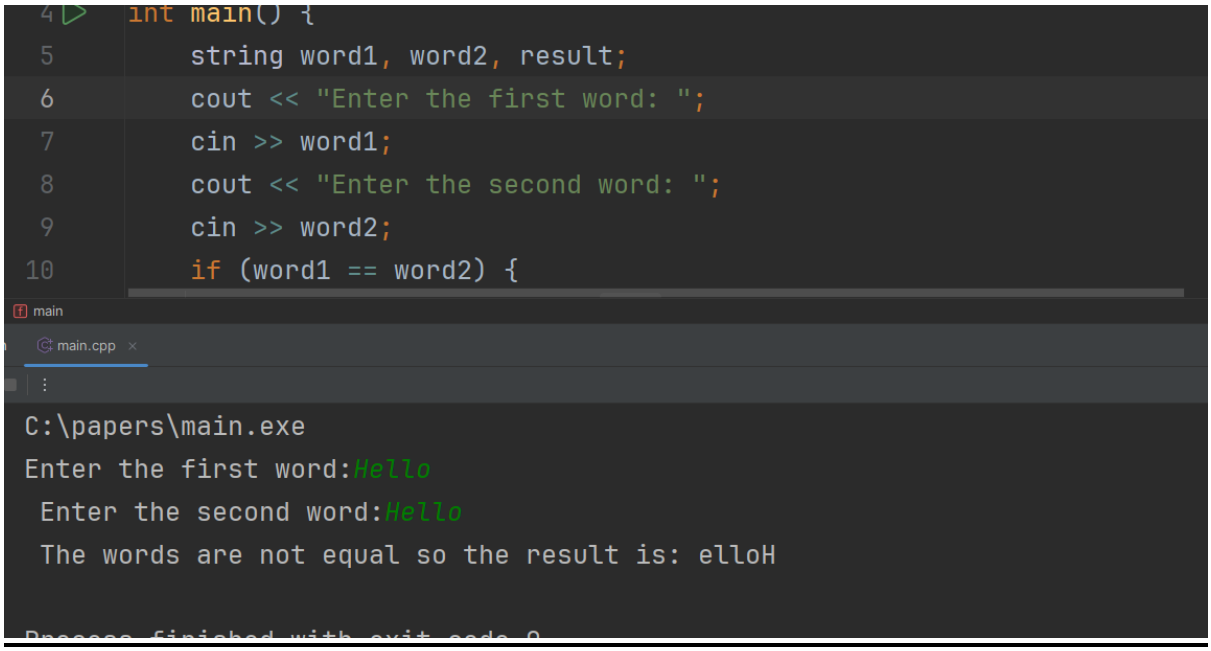
```
C:\papers\main.exe
Enter a number:50
 The largest prime number = 47
Process finished with exit code 0
```

Q 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.

Q 5 (solution):

```
#include <iostream>
#include <string>
using namespace std;
int main() {
    string word1, word2, result;
    cout << "Enter the first word: ";
    cin >> word1;
    cout << "Enter the second word: ";
    cin >> word2;
    if (word1 == word2) {
        result = word1.substr(1) +
word1[0];
        cout << "The words are not
equal so the result is: " << result <<
endl;
    } else {
        cout << "The words are not
equal." << endl;
    }
    return 0;
}
```

Q 5 (result):

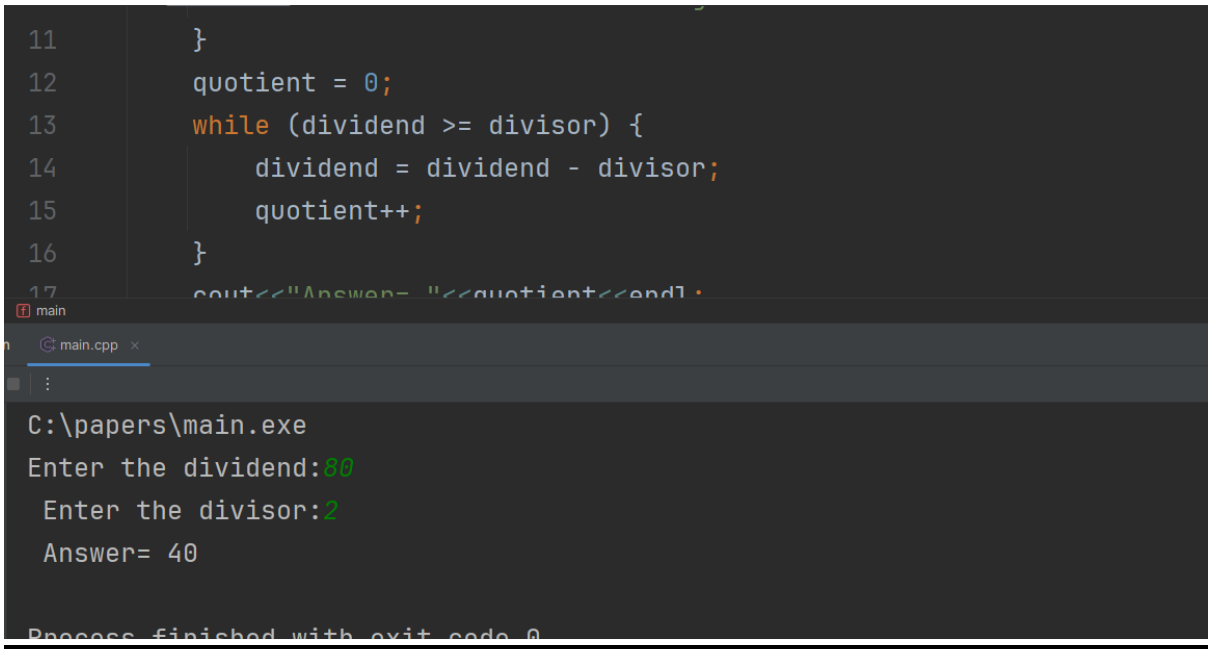

int main() {
string word1, word2, result;
cout << "Enter the first word: ";
cin >> word1;
cout << "Enter the second word: ";
cin >> word2;
if (word1 == word2) {
main
main.cpp
C:\papers\main.exe
Enter the first word:Hello
Enter the second word:Hello
The words are not equal so the result is: elloH

Q 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.

Q 6 (solution):

```
#include <iostream>
using namespace std;
int main() {
    int dividend, divisor, quotient;
    cout<<"Enter the dividend: ";
    cin>>dividend;
    cout<<"Enter the divisor: ";
    cin>>divisor;
    if (dividend < divisor) {
        cout<<"The Dividend must be
greater than the divisor!" <<endl;
    }
    quotient = 0;
    while (dividend >= divisor) {
        dividend = dividend - divisor;
        quotient++;
    }
    cout<<"Answer= "<<quotient<<endl;
    return 0;
}
```

Q 6 (result):

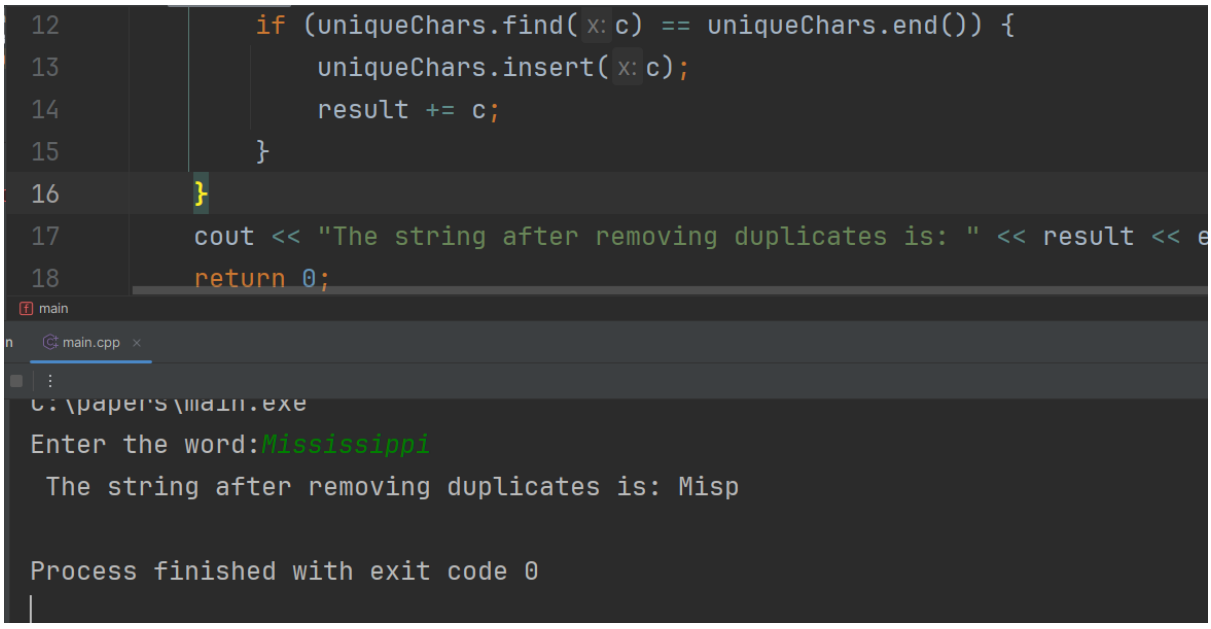

11 }
12 quotient = 0;
13 while (dividend >= divisor) {
14 dividend = dividend - divisor;
15 quotient++;
16 }
main
main.cpp
C:\papers\main.exe
Enter the dividend:80
Enter the divisor:2
Answer= 40

Q 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.

Q 7 (solution):

```
#include <iostream>
#include <string>
#include <set>
using namespace std;
int main() {
    string word;
    cout << "Enter the word: ";
    cin >> word;
    set<char> uniqueChars;
    string result;
    for (char c : word) {
        if (uniqueChars.find(c) ==
uniqueChars.end()) {
            uniqueChars.insert(c);
            result += c;
        }
    }
    cout << "The string after removing
duplicates is: " << result << endl;
    return 0;
}
```

Q 7 (result):

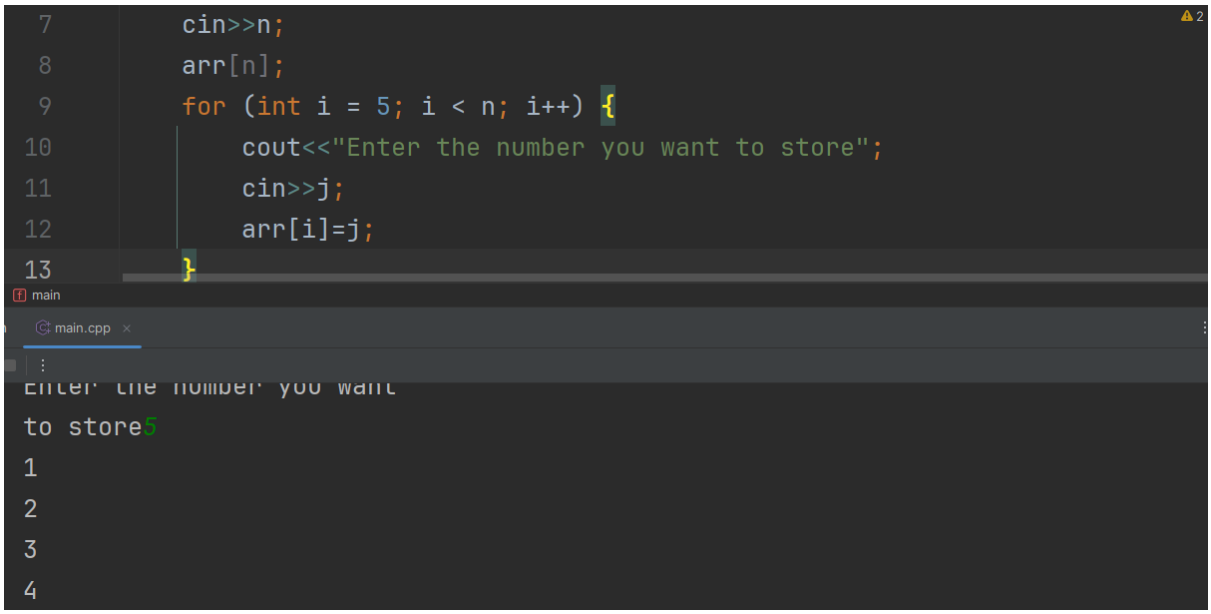

12 if (uniqueChars.find(x: c) == uniqueChars.end()) {
13 uniqueChars.insert(x: c);
14 result += c;
15 }
16 }
17 cout << "The string after removing duplicates is: " << result << e
18 return 0;
main
main.cpp
C:\Papers\main.exe
Enter the word:Mississippi
The string after removing duplicates is: Misp
Process finished with exit code 0

Q 8 : Suppose an integer array a[5] = {1,2,3,4,5}. Add more elements to it and display them in C++.

Q 8 (solution):

```
#include <iostream>
#include <string>
using namespace std;
int main() {
    int arr[5]={1, 2 ,3, 4, 5}, n, j;
    cout<<"Enter the number of element
you want to store in the array: ";
    cin>>n;
    arr[n];
    for (int i = 5; i < n; i++) {
        cout<<"Enter the number you
want to store";
        cin>>j;
        arr[i]=j;
    }
    for (int i = 0; i < n; i++) {
        cout<<arr[i]<<endl;
    }
    cout<<arr;
    return 0;
}
```

Q 8 (result):


cin>>n;
arr[n];
for (int i = 5; i < n; i++) {
cout<<"Enter the number you want to store";
cin>>j;
arr[i]=j;
}
main
main.cpp
to store5
1
2
3
4

Q 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.

Q 9 (solution):

```
#include <iostream>

using namespace std;

bool findTriplet(int A[], int n, int X)
{
    for (int i = 0; i < n - 2; i++) {
        for (int j = i + 1; j < n - 1;
j++) {
            for (int k = j + 1; k < n;
k++) {
                if (A[i] + A[j] + A[k]
== X) {
                    return true;
                }
            }
        }
    }
    return false;
}

int main() {
    int A[] = {-2, 1, 3, 2, 5, 0};
    int n = sizeof(A) / sizeof(A[0]);
    int X = 10;
```

```
    if (findTriplet(A, n, X)) {
        cout << "Triplet found" <<
endl;
    } else {
        cout << "Triplet not found" <<
endl;
    }

    return 0;
}
```

*couldn’t understand it fully *

Q 9 (result):

```
    for (int i = 0; i < n - 2; i++) {
        for (int j = i + 1; j < n - 1; j++) {
            for (int k = j + 1; k < n; k++) {
                if (A[i] + A[j] + A[k] == X) {
                    return true;
                }
```

findTriplet

main.cpp

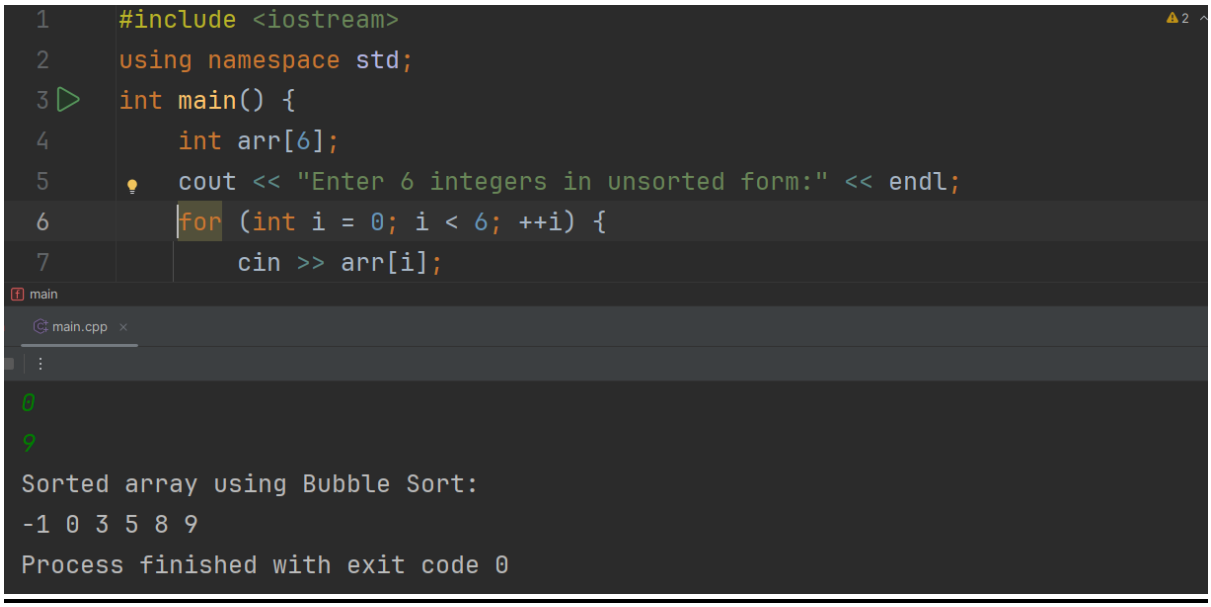
```
C:\papers\main.exe
Triplet found

Process finished with exit code 0
```

Q 10:

Q 10 (solution):

```
#include <iostream>
using namespace std;
int main() {
    int arr[6];
    cout << "Enter 6 integers in
unsorted form:" << endl;
    for (int i = 0; i < 6; ++i) {
        cin >> arr[i];
    }
    for (int i = 0; i < 6 - 1; ++i) {
        for (int j = 0; j < 6 - i - 1;
++j) {
            if (arr[j] > arr[j + 1]) {
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
    cout << "Sorted array using Bubble
Sort:" << endl;
    for (int i = 0; i < 6; ++i) {
        cout << arr[i] << " ";
    }
    return 0;
}
```

Q 10 (results):



```
#include <iostream>
using namespace std;
int main() {
    int arr[6];
    cout << "Enter 6 integers in unsorted form:" << endl;
    for (int i = 0; i < 6; ++i) {
        cin >> arr[i];
```

main

main.cpp

```
0
9
Sorted array using Bubble Sort:
-1 0 3 5 8 9
Process finished with exit code 0
```