



CS-114 - Fundamental of Programing

Assignment # 1

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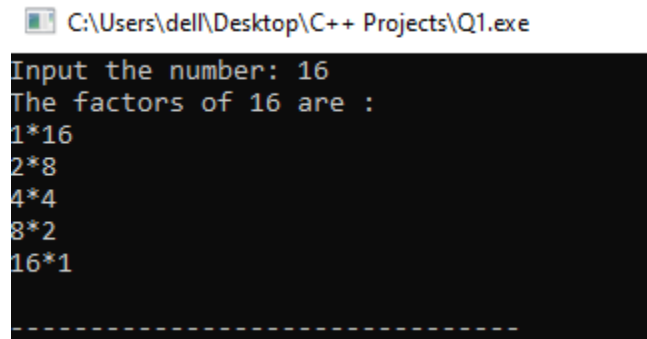
DATE:

12nd November, 2023

Q1) Write a C++ program to display factors of a number using for loops.

```
#include <iostream>
using namespace std;
int main(){
    int num;
    cout<<"Input the number: ";
    cin>>num;
    cout<<"The factors of "<<num<<" are : "<<endl;
    for(int i=1;i<=num;i++){
        if (num%i==0){
            cout<<i<<"*"<<num/i<<endl;
        }
    }
    return 0;
}
```

Example Output:



The screenshot shows a Windows command prompt window titled "C:\Users\dell\Desktop\C++ Projects\Q1.exe". The program has been executed, and the output is displayed in a monospaced font. The input is 16, and the program lists all factors of 16 in the form of multiplication: 1*16, 2*8, 4*4, 8*2, and 16*1. A dashed line is visible at the bottom of the output area.

```
C:\Users\dell\Desktop\C++ Projects\Q1.exe
Input the number: 16
The factors of 16 are :
1*16
2*8
4*4
8*2
16*1
-----
```



Q2) Write output to the following code.

```
#include <iostream>

int main(){
    int x=5;
    int y=5;

    if (x==5){
        if (y==5){
            std::cout<<"x is 5 and y is 10"<<std::endl;
        }
    }
    else{
        std::cout<<"x is not 5"<<std::endl;
    }
    return 0
}
```

Output:

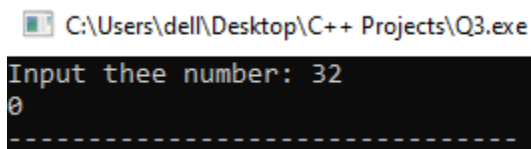
X is 5 and y is 10



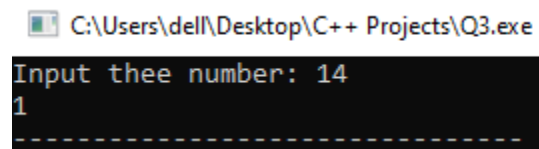
Q3) Write a C++ program, take an integer value from user and check if it's greater than 10 and less than equal to 20. Print 1 if yes and print 0 if no. Use appropriate datatype for output

```
#include <iostream>
using namespace std;
int main(){
    int num;
    bool value;
    cout<<"Input thee number: ";
    cin>>num;
    if (num>10 && num<=20){
        value =true;
    }
    else{
        value =false;
    }
    cout<<value;
    return 0;
}
```

Example Output:



C:\Users\dell\Desktop\C++ Projects\Q3.exe
Input thee number: 32
0



C:\Users\dell\Desktop\C++ Projects\Q3.exe
Input thee number: 14
1



Q4) 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.

```
#include <iostream>
using namespace std;
int main(){
    int num, i;
    bool value;
    cout<<"Input the number: ";
    cin>>num;
    while (num>=2){
        i=2;
        value=false;
        while(i<num){
            if(num%i==0){
                value=true;
                break;
            }
            i++;
        }
        if(value==false){
            cout<<"Largest Prime is "<<num<<endl;
            break;
        }
        num--;
    }
    return 0;
}
```



Example Output:

```
C:\Users\dell\Desktop\C++ Projects\Q4.exe
Input the number: 69
Largest Prime is 67
-----
```

Q5) Write a C++ program, take two strings 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.

Using a string of characters

```
#include <iostream>
#include <limits>
using namespace std;
int main(){
    char a[25], b[25];
    cout<<"Input the first line of text: ";
    cin.get(a, 25);
    cin.ignore(numeric_limits<streamsize>::max(), '\n');
    cout<<"Input the second line of text: ";
    cin.get(b, 25);
    cout<<"The first string is: \n"<<a<<endl;
    cout<<"The second string is: \n";
    for (int i=24; i>=0; i--){
        if (a[i]==b[i]){
            cout<<b[i];
        }
    }
    return 0;
}
```



Example output:

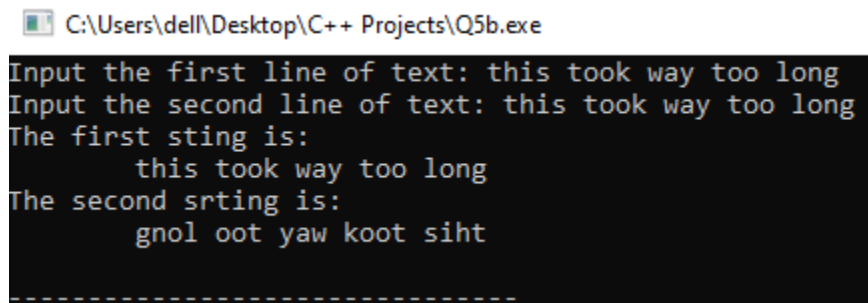
```
C:\Users\dell\Desktop\C++ Projects\Q5.exe
Input the first line of text: this took way too long
Input the second line of text: this took way too long
The first string is:
this took way too long
The second string is:
gnol oot yaw koot siht
-----
```

Using string

```
#include <iostream>
#include <string>
using namespace std;
int main(){
    string a, b;
    int l;
    cout<<"Input the first line of text: ";
    getline(cin, a);
    cout<<"Input the second line of text: ";
    getline(cin, b);
    if (a==b){
        l=a.length();
        for (int i=0; i<l/2; i++){
            swap(b[i], b[l-i-1]);
        }
    }
    cout<<"The first string is: \n\t"<<a<<endl;
    cout<<"The second string is: \n\t"<<b<<endl;
    return 0;
}
```

}

Example Output:



```

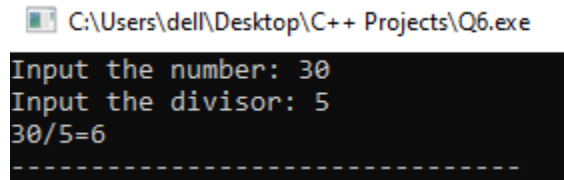
C:\Users\dell\Desktop\C++ Projects\Q5b.exe
Input the first line of text: this took way too long
Input the second line of text: this took way too long
The first sting is:
    this took way too long
The second srting is:
    gnol oot yaw koot siht
-----
    
```

Q6) Perform division in C++ without / using for loops. You can use / only to display the final results. Your dividend must be greater than divisor.

```

#include <iostream>
using namespace std;
int main(){
    int num, divisor, ans;
    cout<<"Input the number: ";
    cin>>num;
    cout<<"Input the divisor: ";
    cin>>divisor;
    for (ans=1; ans<=num; ans++){
        if(divisor*ans==num){
            cout<<num<<"/"<<divisor<<"="<<ans;
            break;
        }
    }
    return 0;
}
    
```


Example Output:



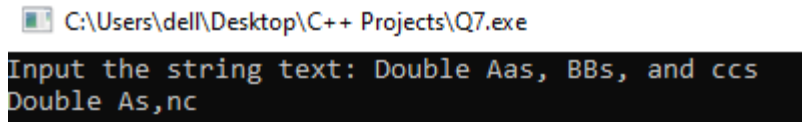
```
C:\Users\dell\Desktop\C++ Projects\Q6.exe
Input the number: 30
Input the divisor: 5
30/5=6
-----
```

Q7) 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.

```
#include <iostream>
#include <string>
using namespace std;
int main(){
    string a;
    int l;
    cout<<"Input the string text: ";
    getline(cin, a);
    l= a.length();
    for (int i=0; i<=l; i++){
        for (int j=0; j<=l; j++){
            if (tolower(a[i])==tolower(a[j]) && i!=j){
                a.erase(j, 1);
                j--;
                l=a.length();
            }
        }
    }
    cout<<a;
    return 0;
}
```



Example Output:

A screenshot of a Windows command prompt window. The title bar shows the file path 'C:\Users\dell\Desktop\C++ Projects\Q7.exe'. The command prompt displays the text 'Input the string text: Double Aas, BBs, and ccs' followed by the user input 'Double As,nc' on the next line.

Q8) Suppose an integer array $a[5] = \{1,2,3,4,5\}$. Add more elements to it and display them in C++

```
#include <iostream>
using namespace std;
int main(){
    int a[50]={1,2,3,4,5};
    cout<<"Input digits into the array. \n"
        <<"Enter 0 to stop the input stream and display the array. \n";
    for (int i=5; i<=49; i++){
        cin>>a[i];
        if (a[i]==0){
            break;
        }
    }
    cout<<"The current values stored in the array: \n";
    for (int j=0; j<=49; j++){
        if (a[j]==0){
            break;
        }
        cout<<a[j]<<endl;
    }
    return 0;
}
```

Example Output:

```
C:\Users\dell\Desktop\C++ Projects\Q8.exe
Input digits into the array.
Enter 0 to stop the input stream and display the array.
23
34
45
76
87
09988
23445
0
The current values stored in the array are:
1
2
3
4
5
23
34
45
76
87
9988
23445
-----
```



Q9) 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.

```
#include <iostream>
using namespace std;
int main(){
    int length, a[length], num, j, k, l;
    bool value=false;
    cout<<"Input the length of the input array: ";
    cin>>length;
    cout<<"Input the values in the array: ";
    for (int i=0; i<length; i++){
        cin>> a[i];
    }
    cout<<"Input a number: ";
    cin>>num;
    for(j=0; j<length; j++){
        for(k=j+1; k<length; k++){
            for (l=k+1; l<length; l++){
                if (a[j]+a[k]+a[l]==num){
                    value=true;
                    break;
                }
            }
        }
        if(value==true){
            break;
        }
    }
    if(value==true){
        break;
    }
    cout<<num<<" is the sum of "<<a[j]<<"(Array."<<j+1<<" ,"
```



```

    <<a[k]<<"(Array."<<k+1<<" ) & "
    <<a[l]<<"(Array."<<l+1<<" )";

    return 0;
}

```

Example Output:

```

C:\Users\dell\Desktop\C++ Projects\Q9.exe
Input the length of the input array: 4
Input the values in the array: 1
2
3
4
Input a number: 9
9 is the sum of 2(Array.2) ,3(Array.3) & 4(Array.4)
-----

```

Q10) Implement Bubble Sort on an array of 6 integers.

```

#include <iostream>
using namespace std;
int main(){
    int a[6];
    cout<<"Input 6 integers in the array: \n";
    for (int i=0; i<=5; i++){
        cin>>a[i];
    }
    for(int j=0; j<=5; j++){
        for (int k=0; k<=5; k++){
            if (a[k]>a[k+1]){
                swap(a[k], a[k+1]);
            }
        }
    }
}

```



```
}  
cout<<"The sorted values are: \n";  
for (int l=0; l<=5; l++){  
    cout<<a[l]<<"\n";  
}  
return 0;  
}
```

Example Output:

```
C:\Users\dell\Desktop\C++ Projects\Q10.exe  
Input 6 integers in the array:  
68  
93  
11  
13  
99  
5  
The sorted values are:  
5  
11  
13  
43  
68  
93  
-----
```