



# NUST

NATIONAL UNIVERSITY  
OF SCIENCES & TECHNOLOGY

## **CS-114 - Fundamental of Programing**

### **Assignment 1**

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Section: B

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

```
#include <iostream>

using namespace std;

int main(){

    int a;

    cout << "Enter a number: ";

    cin >> a;

    cout << "The factors of "<<a<<" are : "<<endl;

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

        if (a % i == 0){

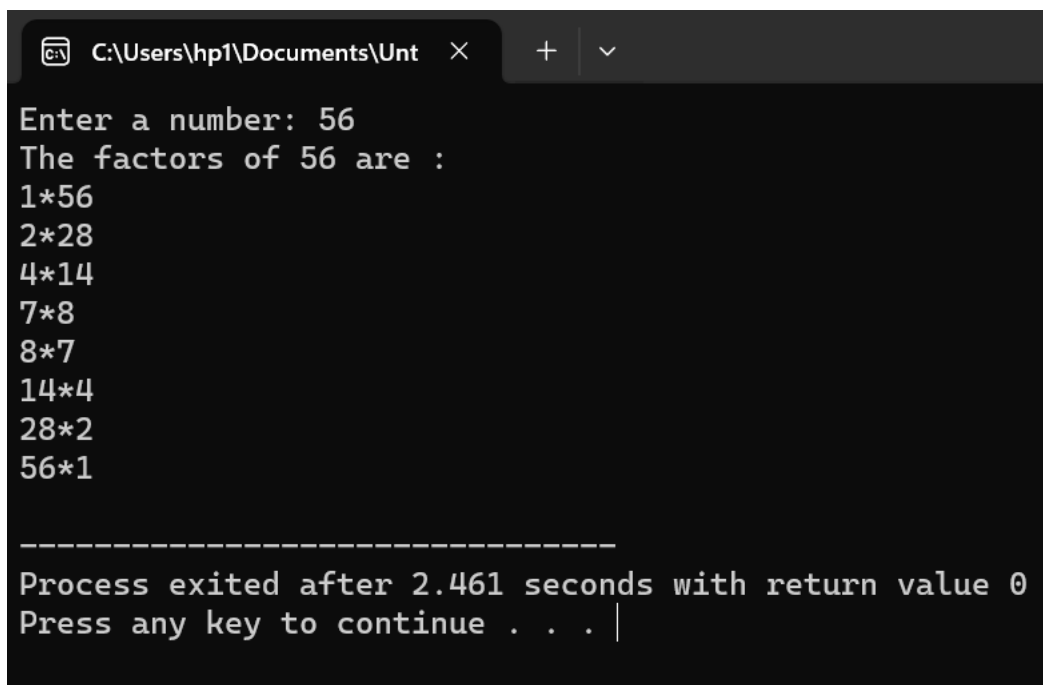
            cout << i << "*" << a/i << endl;

        }

    }

    return 0;

}
```

A screenshot of a Windows terminal window with a dark background. The title bar shows the file path 'C:\Users\hp1\Documents\Unt' and standard window controls. The terminal displays the output of the C++ program: 'Enter a number: 56', 'The factors of 56 are :', followed by a list of factor pairs: '1\*56', '2\*28', '4\*14', '7\*8', '8\*7', '14\*4', '28\*2', and '56\*1'. Below this, a separator line is shown, followed by the message 'Process exited after 2.461 seconds with return value 0' and 'Press any key to continue . . . |'.

```
C:\Users\hp1\Documents\Unt  X  +  v

Enter a number: 56
The factors of 56 are :
1*56
2*28
4*14
7*8
8*7
14*4
28*2
56*1

-----
Process exited after 2.461 seconds with return value 0
Press any key to continue . . . |
```

**2) 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

**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.**

```
#include <iostream>

using namespace std;

int main(){

    int a;

    bool flag;

    cout << "Enter a number: ";

    cin >> a;

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

        flag = true;

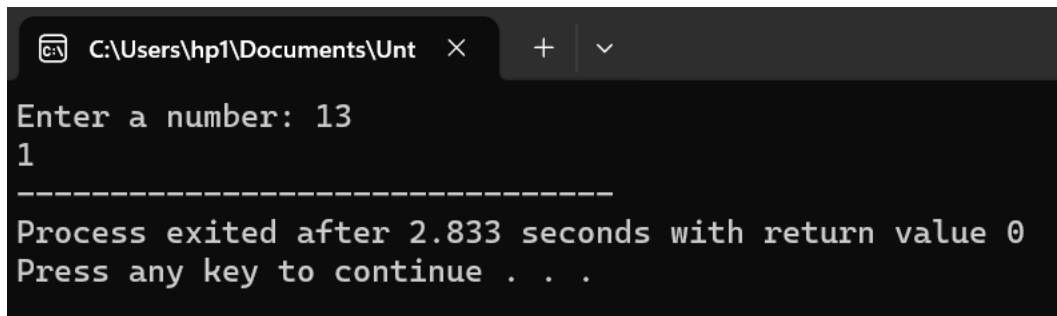
    }

}
```

```

else{
    flag =false;
}
cout << flag;
return 0;
}

```



```

C:\Users\hp1\Documents\Unt
Enter a number: 13
1
-----
Process exited after 2.833 seconds with return value 0
Press any key to continue . . .

```

**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.**

```

#include <iostream>

using namespace std;

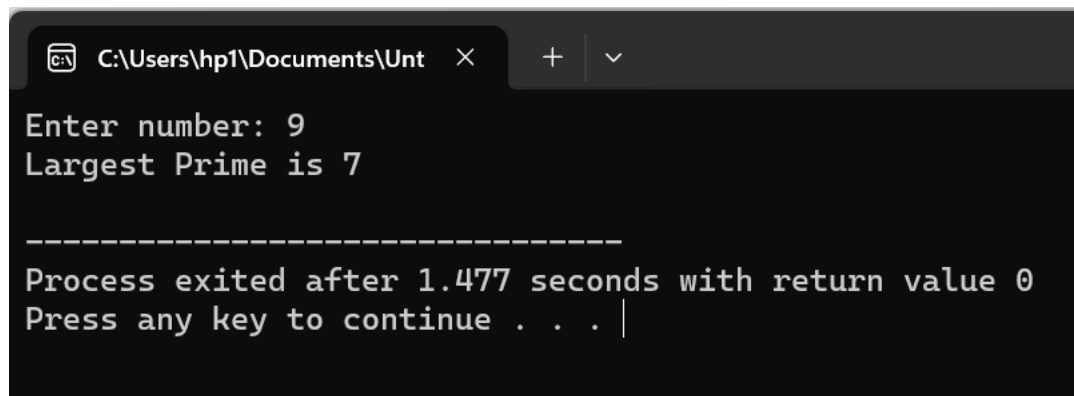
int main(){
    int a, i;
    bool number;
    cout<<"Enter number: ";
    cin>>a;
    while (a>=2){
        i=2;
        number=false;
        while(i<a){

```

```

        if(a%i==0){
            number=true;
            break;
        }
        i++;
    }
    if(number==false){
        cout<<"Largest Prime is "<<a<<endl;
        break;
    }
    a--;
}
return 0;
}

```



```

C:\Users\hp1\Documents\Unt
Enter number: 9
Largest Prime is 7

-----
Process exited after 1.477 seconds with return value 0
Press any key to continue . . . |

```

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.

```

#include <iostream>

#include <limits>

```

```

using namespace std;

int main(){
    char x[25], y[25];

    cout<<"Input first line: ";

    cin.get(x, 25);

    cin.ignore(numeric_limits<streamsize>::max(), '\n');

    cout<<"Input second line: ";

    cin.get(y, 25);

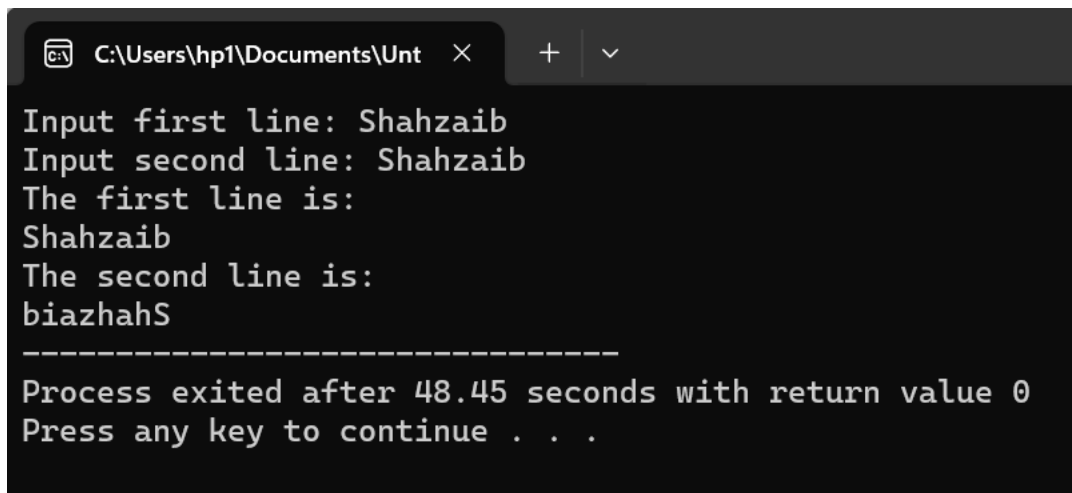
    cout<<"The first line is: \n"<<x<<endl;

    cout<<"The second line is: \n";

    for (int i=24; i>=0; i--){
        if (x[i]==y[i]){
            cout<<y[i];
        }
    }

    return 0;
}

```



```

C:\Users\hp1\Documents\Unt x + v
Input first line: Shahzaib
Input second line: Shahzaib
The first line is:
Shahzaib
The second line is:
biazhahS
-----
Process exited after 48.45 seconds with return value 0
Press any key to continue . . .

```

**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.**

```
#include <iostream>

using namespace std;

int main(){

    int a, x, b;

    cout<<"Input the number: ";

    cin>>a;

    cout<<"Input the divisor: ";

    cin>>x;

    for (b=1; b<=a; b++){

        if(x*b==a){

            cout<<a<<"/"<<x<<"="<<b;

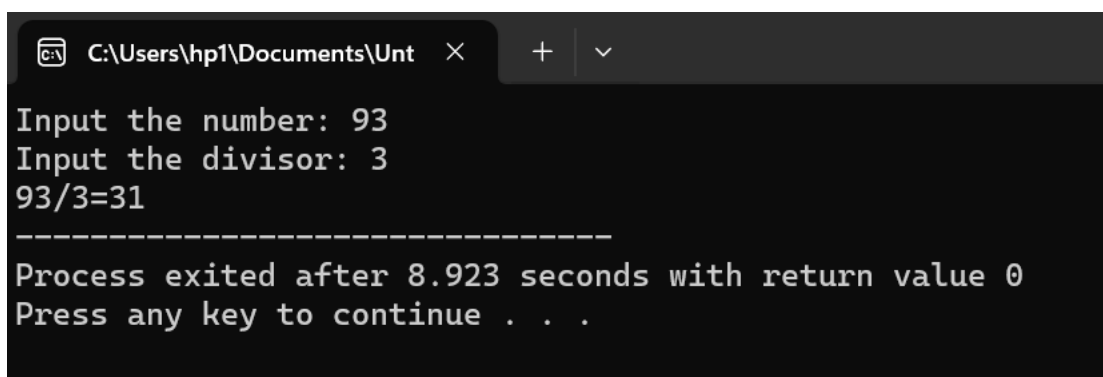
            break;

        }

    }

    return 0;

}
```



```
C:\Users\hp1\Documents\Unt  X  +  v

Input the number: 93
Input the divisor: 3
93/3=31
-----
Process exited after 8.923 seconds with return value 0
Press any key to continue . . .
```

**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.**

```
#include <iostream>

#include <string>

using namespace std;

int main(){

    string a;

    int b;

    cout<<"Enter text: ";

    getline(cin, a);

    b= a.length();

    for (int i=0; i<=b; i++){

        for (int k=0; k<=b; k++){

            if (tolower(a[i])==tolower(a[k]) && i!=k){

                a.erase(k, 1);

                k--;

                b=a.length();

            }

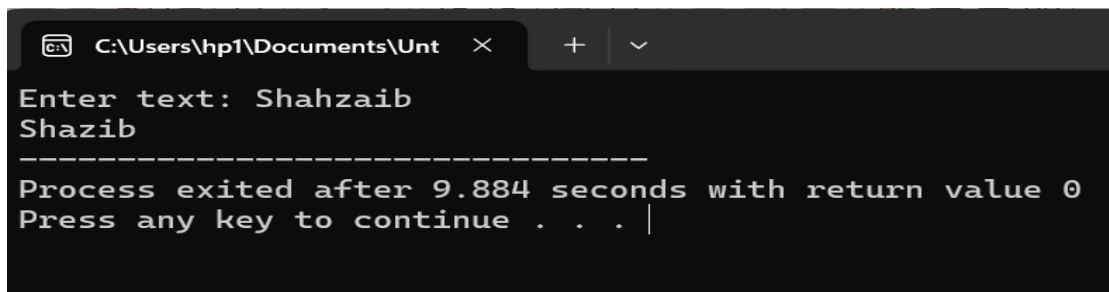
        }

    }

    cout<<a;

    return 0;

}
```



```
C:\Users\hp1\Documents\Unt  ×  +  ▾

Enter text: Shahzaib
Shazib
-----
Process exited after 9.884 seconds with return value 0
Press any key to continue . . . |
```



**8) 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 x[50]={1,2,3,4,5};

    cout<<"Enter numbers in array \n"

        <<"Enter 0 to stop the input stream and display the array. \n";

    for (int i=5; i<=49; i++){

        cin>>x[i];

        if (x[i]==0){

            break;

        }

    }

    cout<<"The current values stored in the array are: \n";

    for (int k=0; k<=49; k++){

        if (x[k]==0){

            break;

        }

        cout<<x[k]<<endl;

    }

    return 0;

}
```

```
C:\Users\hp1\Documents\Unt  X + v
Enter numbers in array
Enter 0 to stop the input stream and display the array.
6,9,12,34,5
The current values stored in the array are:
1
2
3
4
5
6

-----
Process exited after 12.73 seconds with return value 0
Press any key to continue . . .
```

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.

```
#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;
}

```

```
C:\Users\hp1\Documents\Unt  X + v
Input the length of the input array: 5
Input the values in the array: 3,5,6,9,7
Input a number: 8 is the sum of 0(Array.2) ,0(Array.3) & 8(Array.5)
-----
Process exited after 14.7 seconds with return value 0
Press any key to continue . . . |
```

### 10) Implement Bubble Sort on an array of 6 integers.

```
#include <iostream>

using namespace std;

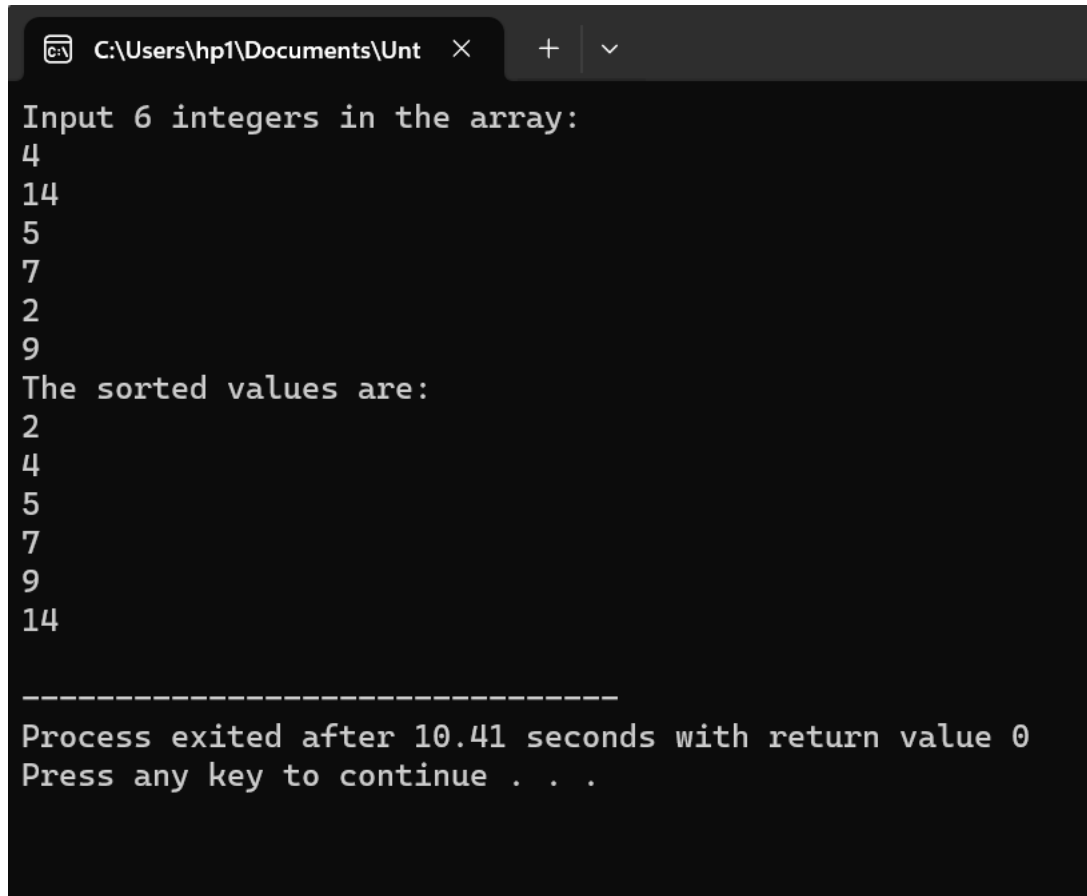
int main(){

    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;  
}
```



The screenshot shows a C++ IDE window with the file path `C:\Users\hp1\Documents\Unt`. The output of the program is displayed in a dark-themed console. It prompts the user to "Input 6 integers in the array:", followed by six lines of input: 4, 14, 5, 7, 2, and 9. The program then outputs "The sorted values are:" followed by the sorted numbers: 2, 4, 5, 7, 9, and 14. A separator line of dashes follows. The final output indicates the process exited after 10.41 seconds with a return value of 0 and prompts the user to "Press any key to continue . . .".

```
C:\Users\hp1\Documents\Unt × + ▾  
Input 6 integers in the array:  
4  
14  
5  
7  
2  
9  
The sorted values are:  
2  
4  
5  
7  
9  
14  
  
-----  
Process exited after 10.41 seconds with return value 0  
Press any key to continue . . .
```