Fundamentals of Programming

Name: Syed Asad Raza Zaidi

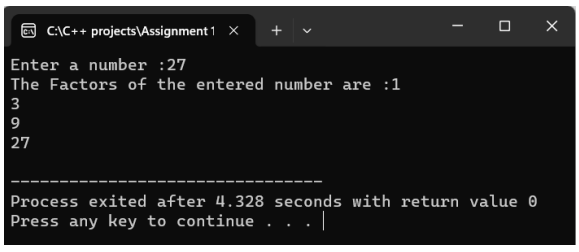
Section: ME-15A

Roll no: 464239

ASSIGNMENT

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

```
#include<iostream>
using namespace std;
int main()
{
	int x;
	cout<<"Enter a number :";
	cin>>x;
	cout<<"The Factors of the entered number are :";
	for(int i=1; i<=x; i++){
		if(x%i==0)  cout<<i<<endl;
		else
		continue;
	}
	return 0;
}
```



2. Write output to the following code.

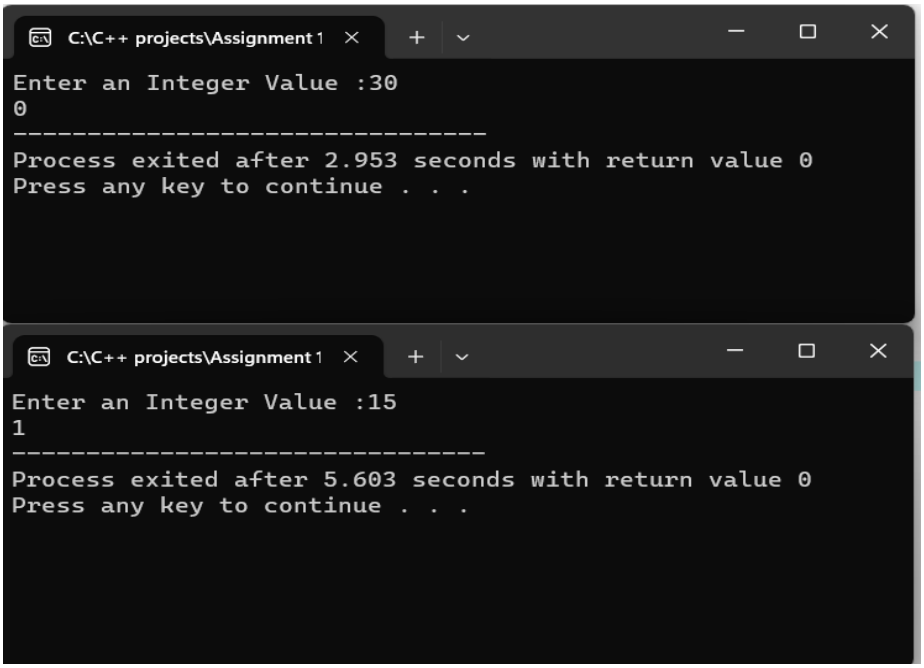
```
#include <iostream>

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;
}
```

Answer:

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.

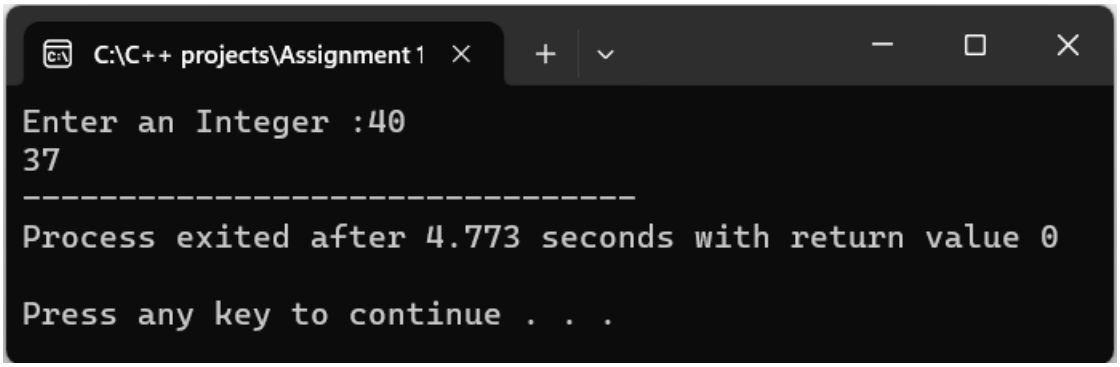
```
#include<iostream>

using namespace std;

int main()

{

        int x;

        cout<<"Enter an Integer Value :";

        cin>>x;

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

        cout<<"1";

        else

        cout<<"0";


        return 0;

}
```



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.

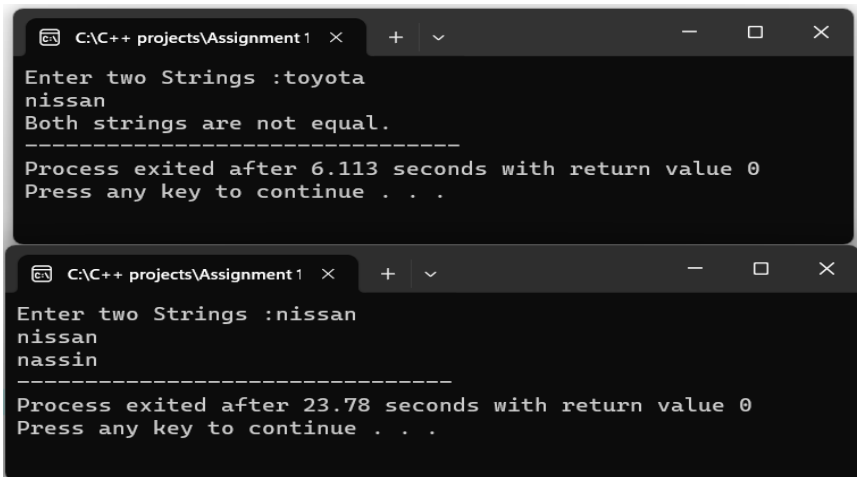
```
#include<iostream>

using namespace std;

int main()

{

        int N, x, j;

        bool prime;

        cout<<"Enter an Integer :";

        cin>>N;

        if(N<=0)

        cout<<"Invalid Entry.";


        if(N==1)
```

```
        cout<<"There is no prime.";
        j=N-1;

        while(N>1){
            while(j>1){
                if(N%j==0){
                prime = false;
                break;
                }
                else if(N%j!=0){
                   prime=true;
                        x=N;   }
                j--;
            }
            if(prime==true){
            cout<<N;
            break;  }
            N--;
        }
        return 0;
}
```



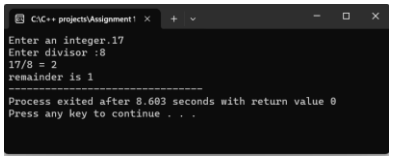
5. Write a C++ program, take two string as input from user and check if both strings are equal or not. If they are equal make them unequal by rotating string. e.g., Hello is turned into olleH etc.

```
#include<iostream>

using namespace std;

int main()

{

        string n1, n2;

        string r;

       cout<<"Enter two Strings :";

        cin>>n1>>n2;

        if(n1==n2){

                for(int i=n1.length(); i>=0; --i){

                        r=n1[i];

                        cout<<r;

                }

        }

  if(n1!=n2)

  cout<<"Both strings are not equal.";

  return 0;

}
```



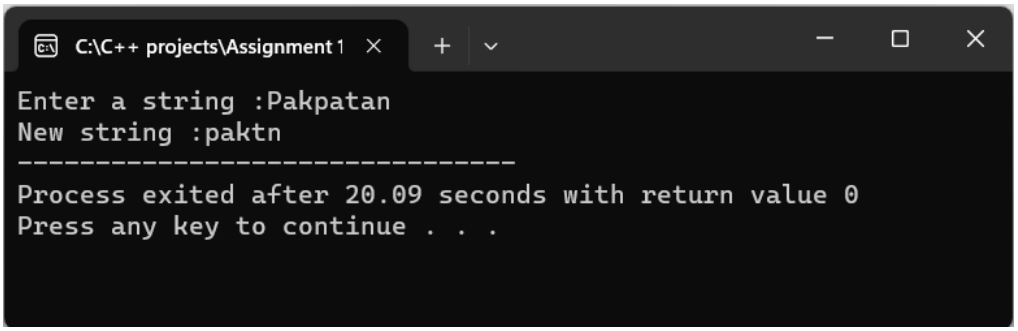
6. Perform division in C++ without / using for loops. You can use / only to display the final results. Your dividend must be greater than divisor.

```
#include<iostream>

using namespace std;

int main()

{

        int n, d, q=0, r=0;

        cout<<"Enter an integer.";       //n is dividend

        cin>>n;                          // d is divisor

        cout<<"Enter divisor :";         // r is remainder

        cin>>d;                         // q is quoteint

        if(n>d)

        {

                for(int i=n; i>=d; i--){

                if(i%d==0)

                q=q+1;

                }

   cout<<n<<'/'<<d<<" = "<<q<<endl;

   r=n%d;

   cout<<"remainder is "<<r;

        }

   else

   cout<<"Invalid Entry.";

   return 0;

}
```



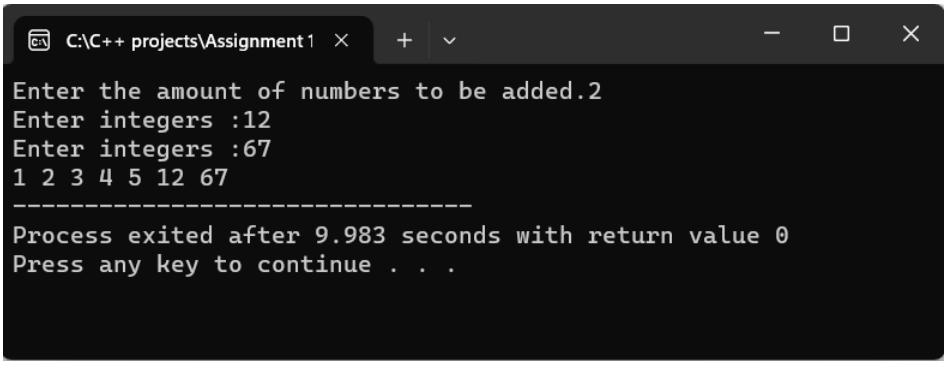
7. Write a C++program for a string which may contain lowercase and uppercase characters. The task is to remove all duplicate characters from the string and find the resultant string.

```
#include<iostream>

using namespace std;

int main()

{

	string a, t;

	cout<<"Enter a string :";

	cin>>a;

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

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

			if(i!=j){

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

					a[j]=a[j+1];

					a[j+1]=' ';

				}

			}

		}

	}

	cout<<"New string :"<<a;

	return 0;

}
```



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

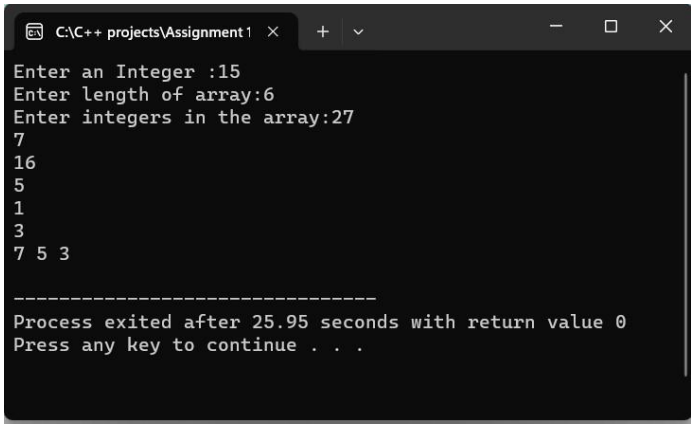
```
{
        int n=5;
        int a[n]= {1,2,3,4,5};
        int x, y;
        int b[y];
        cout<<"Enter the amount of numbers to be added.";
        cin>>x;
        for(int i=0; i<5; i++){
                b[i]=a[i];
        }

        for(int i=0; i<x; i++){
                cout<<"Enter integers :";
                cin>>b[n+i];
        }
        for(int i=0; i<n+x; i++){
                cout<<b[i]<<" ";
        }
}
```



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 n,I=0, a[n], s=0;
	cout<<"Enter an Integer :";
	cin>>I;
	cout<<"Enter length of array:";
	cin>>n;
	cout<<"Enter integers in the array:";
	for(int i=0; i<n; i++){
		cin>>a[i];
	}
	for(int i=0; i<n; i++){
		for(int j=i+1; j<n; j++){
			for(int k=j+1; k<n; k++){
				s=a[i]+a[j]+a[k];
				if(s==I){
					cout<<a[i]<<" "<<a[j]<<" "<<a[k]<<endl;
				}
			}
		}
	}
	if(s!=I){
		cout<<"No triplet found.";
	}
	return 0;
```

}



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

```
#include<iostream>
using namespace std;
int main()
{
	int n=6;
	int a[n];
	cout<<"Enter 6 integers in an array :";
	for(int i=0; i<6; i++){
	cin>>a[i];
	}
	int counter=1;
	int temp=0;
	while(counter<n){
		for(int i=0; i<n-counter; i++){
		 if(a[i]>a[i+1]){
			temp=a[i];
		   a[i]=a[i+1];
```

```
                a[i+1]=temp;
            }
            }
            counter++;
        }
        for(int i=0; i<6; i++){
            cout<<a[i]<<" ";
        }
        return 0;
}
```