Question –

Write a program to print the first n prime numbers.

Code –

```cpp
#include <iostream>
using namespace std;

bool isPrime(int num)
{
    if (num <= 1)
        return false;
    for (int i = 2; i * i <= num; ++i)
        if (num % i == 0)
            return false;
    return true;
}

int main()
{
    int n, count = 0, num = 2;
    cout << "Enter the value of n: ";
    cin >> n;

    while (count < n)
    {
        if (isPrime(num))
        {
            cout << num << " ";
            ++count;
        }
        ++num;
    }

    cout << endl;
    return 0;
}
```

Output –

```
Enter the value of n: 5
2 3 5 7 11
```

Question –

Write a program to print the following patterns -

1)

A

AB

ABC

ABCD

ABCDE

2)

```
   *
  ***
 *****
*******
```


3)

```
*    *
**  **
******
**  **
*    *
```

Code –

```cpp
#include <iostream>
using namespace std;

void pattern1(int n)
{
    for (int i = 1; i <= n; ++i)
    {
        char ch = 'A';
        for (int j = 1; j <= i; ++j)
            cout << ch++;
        cout << endl;
    }
}

void pattern2(int n)
{
    for (int i = 1; i <= n; ++i)
    {
        for (int s = 1; s <= n - i; ++s)
            cout << " ";
        for (int j = 1; j <= 2 * i - 1; ++j)
            cout << "*";
        cout << endl;
    }
}

void pattern3(int size)
{
    for (int i = 1; i <= size; i++)
    {
        for (int j = 1; j <= i; j++)
        {
            cout << "*";
        }

        for (int j = 1; j <= 2 * (size - i); j++)
        {
            cout << " ";
        }

        for (int j = 1; j <= i; j++)
        {
            cout << "*";
```

```cpp
        }
        cout << endl;
    }

    for (int i = size - 1; i >= 1; i--)
    {
        for (int j = 1; j <= i; j++)
        {
            cout << "*";
        }

        for (int j = 1; j <= 2 * (size - i); j++)
        {
            cout << " ";
        }

        for (int j = 1; j <= i; j++)
        {
            cout << "*";
        }
        cout << endl;
    }
}

int main()
{
    cout << "Pattern 1:" << endl;
    pattern1(5);

    cout << "\nPattern 2:" << endl;
    pattern2(4);

    cout << "\nPattern 3:" << endl;
    pattern3(3);

    return 0;
}
```

Output –

```
Pattern 1:
A
AB
ABC
ABCD
ABCDE

Pattern 2:
    *
   ***
  *****
 *******

Pattern 3:
*       *
**     **
******
**     **
*       *
```

Question –

Write a program to print GCD of 2 numbers where 2 numbers are entered by the user.

Code –

```cpp
#include <iostream>
using namespace std;

int gcd(int a, int b)
{
    while (b != 0)
    {
        int temp = b;
        b = a % b;
        a = temp;
    }
    return a;
}
```

```cpp
int main()
{
    int num1, num2;
    cout << "Enter two numbers: ";
    cin >> num1 >> num2;

    int result = gcd(num1, num2);
    cout << "GCD is: " << result << endl;

    return 0;
}
```

Output –

```
Enter two numbers: 255
25
GCD is: 5
```