22) Square Display

Write a program that asks the user for a positive integer no greater than 15. The program should then display a square on the screen using the character 'X'. The number entered by the user will be the length of each side of the square. For example, if the user enters 5, the program should display the following:

XXXXX XXXXX

XXXXX

XXXXX

XXXXX

If the user enters 8, the program should display the following:

XXXXXXX

XXXXXXX

XXXXXXXX

XXXXXXX

XXXXXXX

XXXXXXX

XXXXXXX

XXXXXXX

(23) Pattern Displays

Write a program that uses a loop to display Pattern A below, followed by another loop that displays Pattern B.

Pattern A	Pattern B
+	+++++++
++	+++++++ (0398)
+++	++++++
++++	+++++
++++	+++++
+++++	++++
++++++	+++
++++++	+++
++++++	++
+++++++	+

20. Random Number Guessing Game

Write a program that generates a random number and asks the user to guess what the number is. If the user's guess is higher than the random number, the program should display "Too high, try again." If the user's guess is lower than the random number, the program should display "Too low, try again." The program should use a loop that repeats until the user correctly guesses the random number.

Enhance the program that you wrote for Programming Challenge 20 so it keeps a count of the number of guesses that the user makes. When the user correctly guesses the random number, the program should display the number of guesses.



Nested Loops

CONCEPT: A loop that is inside another loop is called a *nested loop*.

A nested loop is a loop that appears inside another loop. A clock is a good example of something that works like a nested loop. The second hand, minute hand, and hour hand all spin around the face of the clock. The hour hand, however, only makes one revolution for every 12 of the minute hand's revolutions. And it takes 60 revolutions of the second hand for the minute hand to make one revolution. This means that for every complete revolution of the hour hand, the second hand has revolved 720 times.

Here is a program segment with a for loop that partially simulates a digital clock. It displays the seconds from 0 to 59:

```
cout << fixed << right;
cout.fill('0');
for (int seconds = 0; seconds < 60; seconds++)
   cout << setw(2) << seconds << endl;</pre>
```



NOTE: The fill member function of cout changes the fill character, which is a space by default. In the program segment above, the fill function causes a zero to be printed in front of all single digit numbers.

We can add a minutes variable and nest the loop above inside another loop that cycles through 60 minutes:

```
cout << fixed << right;
cout.fill('0');
for (int minutes = 0; minutes < 60; minutes++)

{
  for (int seconds = 0; seconds < 60; seconds++)

      cout << setw(2) << minutes << ":";
      cout << setw(2) << seconds << endl;
    }
}

How many liner of output does this program

Segment produce?
```