**Problem 1** Write a C++ program that asks the user to enter an odd positive integer \( n \). If \( n \) is even or negative the program should exit. Otherwise the program should print a triangle with \( n \) rows and \((n + 1)/2\) columns that points to the right.

For example, if the user specified 9 for \( n \), the program would print as follows:

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

**Problem 2** Write a C++ program that asks the user to enter a positive integer \( n \). If \( n \) is not positive the program should exit. Otherwise the program should print \( n \) triangles in a vertical stack. Each triangle should have \( 2n - 1 \) columns and \( n \) rows and should point upwards.

For example, if the user specified 3 for \( n \), the program should print as follows:

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

**Problem 3** Write a complete C++ program that asks the user for a number \( n \) and prints 2 large copies of an X pattern (each with height \( n \)) in a horizontal sequence.

For example, if the user specified 5 for \( n \), the program would print as follows:

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

**Problem 4** Write a complete C++ program that asks the user for a number \( n \) and prints 3 large copies of an L pattern (each with height \( n \)) in a horizontal sequence.

For example, if the user specified 4 for \( n \), the program would print as follows:

```
*   *   *   * 
*   *   *   * 
*   *   *   * 
**** **** **** 
```
Problem 5 Write a complete C++ program that asks the user for a number \( n \) and prints \( n \) diagonal stripes (each with height \( n \) and width \( n \)) in a horizontal sequence.

For example, if the user specified 4 for \( n \), the program would print as follows:

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

Problem 6 Write a complete C++ program that asks the user for a height \( h \) and prints a white X pattern (made of spaces) against a dark background made of Xs.

For example, if the user specified 7 for \( h \), the program would print as follows:

```
XXXXXX
X XXX X
XX X XX
XXX XXX
XX X XX
X XXX X
 XXXXX
```

Problem 7 Write a complete C++ program that does the following.

1. It asks the user to enter an integer \( n \) that is between 1 and 21.
2. It repeatedly reads \( n \) from the user until the supplied value of \( n \) is legal.
3. It prints out a picture of an \( n \times n \) square formed of X characters except that a diagonal stripe, formed by the diagonal and any position immediately to its right, is printed using an O character.

Here is an example of how the program should work:

Give me an integer between 1 and 21: 5

```
OOXXX
XOOXX
XXOOX
XXXOO
XXXXO
```

Problem 8 Write a complete C++ program that does the following.

1. It asks the user to enter an integer \( n \) that is between 1 and 9.
2. It repeatedly reads \( n \) from the user until the supplied value of \( n \) is legal.
3. It prints out a picture of an upside down triangle with \( n \) rows, in which the symbol used to print each row is the row’s number.

Here is an example of how the program should work:

Give me an integer between 1 and 9: 5

```
11111
2222
333
44
5
```