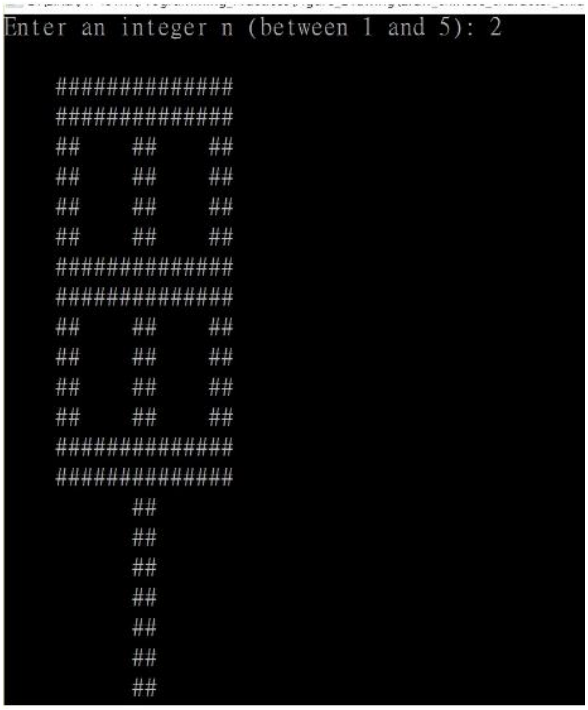
Programming Practice: Draw Figure

1. Write a C program that reads in a positive integer side from 3 to 29, and draws an isosceles triangle with side length side and base length 2*side-1. Output 10 blanks on the left side of the figure, use '*' to mark the sides of the isosceles triangle, and blanks to mark the interior points of the isosceles triangle. Program source code: draw_triangle.c.

2. Write a C program that reads in a positive integer side from 2 to 30 and draws a square with each side of length side. Output 10 blanks on the left side of the figure, use '*' to mark the sides of the square and blanks to mark the interior points of the square. Program source code: draw_square.c.

3. Write a C program that reads in a positive integer side from 3 to 29 and draws a solid rhombus (diamond) with side of length side. Output 10 blanks on the left side of the figure, using '*' to mark the sides of the rhombus, and '@' to mark the interior points of the rhombus. Program source code: draw_rhombus.c.

4. Write a C program to draw the Chinese character "Chia"「甲」 of "Feng Chia University". Read integer n of value 1 to 5 (including) as the width of the strokes of a Chinese character. Use character '#' to draw the strokes. The top-half of 「甲」 is character「田」 with each white space being a square of side n+2; the lower-half of 「甲」 is a vertical bar with length 3n+1. The following is the sample output of n=2.



   Program source code: draw_chinese_character_chia.c.

5. A Christmas tree can be designed as a multi-layer solid isosceles triangle, the uppermost triangle has the smallest side length, and the lower triangle side length is larger. For two adjacent triangles, the apex of the lower triangle will overlap the bottom of the triangle above it. Finally, a rectangular trunk will be

immediately adjacent to the bottom of the lowermost triangle. Write a C program to draw a Christmas tree as defined below.

1. A Christmas tree can be 2 to 5 tiers. (layer)
2. The side of the uppermost triangle can be 3 to 6 points long. (side)
3. A lower triangle side may be 1 to 5 points larger than it upper one. (growth)
4. The width of the trunk is an odd integer from 3 to 9. (width)
5. The height of the trunk can be 4 to 10 points. (height)
6. Use '#' to mark the points on the sides of the triangle, '@' to mark the points inside the triangle, and '|' to mark the points of the trunk.

Example of program execution: