

Programming Assignment 1: Draw House

In this assignment you will design and draw the front view of a one-story house. The house roof is an isosceles trapezoid. The house has two windows and an entrance door at the center near the floor. The body of the house is represented as a rectangle. The two windows are located at two sides of the door.



The house is described as the followings:

1. The width of the roof top is `r_top` is 40 characters. The isosceles side of the roof, between the roof top and bottom, is `r_side` of 16 characters. Hence, the width of the roof bottom `r_bottom` is `r_top+2*r_side=72`. The boundary points of the roof are marked using '#' and the interior points are marked using '*'.
2. The thickness of each ceiling, wall, and floor is 2 characters and they are marked using '@' and there are two space characters ' ' from two end of the roof bottom to the outside wall. The height of exterior of is 44 characters between the roof bottom and the ground. That is, the ceiling, the left wall, the right wall, and the floor form a 68×44 rectangle with two-character thick.
3. A door of width 20 characters and height 28 characters is at the center of the house. The door is 10 spaces below the ceiling and 2 spaces above the floor. The door is marked using '&'.
4. There are two windows on the two side of the door. A window occupies 25 characters in the horizontal direction and 16 characters in the vertical direction and it is a grid of 4 (horizontal) rows and 3 (vertical) columns. Each grid cell is glass of width 4 and height 5 filling with ' ' characters. The frame and the grid lines of the window is one character thick. The surrounding frame and the horizontal grid line are marked using '=' and the vertical grid line between two '=' is marked using '+'. The windows are 10 spaces below the ceiling and 5 spaces above the floor.
5. There are 2 space characters ' ' between wall and window and 4 space characters ' ' between window and door.
6. Calculate and verify the following facts:
 - (a) the total width and height, including the roof of the house are 72 and 62, respectively,
 - (b) the exterior width and height of the house are 68 and 44, respectively,
 - (c) the interior width and height of the house are 64 and 40, respectively,

Write comments in your program solution as much detailed as possible. Also, write a report to explain how to verify a valid design of the house and the working experience of your program solution such as the process how you develop your program and problems you encounter. Homework assignment 1 is due by **11:59 pm, Wednesday, October 4**. Use **assgn1_DXXXXXXX.c** for your source code file and **assgn1_DXXXXXXX.pdf** for your report. where DXXXXXXX is your student ID. Submit the source code and the report to **iLearn**.

Example of program execution: (in the next page)

[illegible]