

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 width of the roof top is `r_top` of value between 10 and 20. The isosceles side of the roof, between the roof top and bottom, is `r_side` of value between 10 and 25. Hence, the width of the roof bottom `r_bottom` is `r_top+2*r_side`. The boundary points of the roof are marked using '@' and the interior points are marked using '*'. The width of the house body, not including the wall, is `h_width` and the height, not including the floor, is `h_height`. Let us assume the thickness of each wall and the floor is 2 and they are marked using '%' The value of `h_width` must be less than `r_bottom-4` and `h_height` is less than or equal to `h_width`. The values of `r_bottom` and `h_width` must be both even or both odd. The top position of the windows and the door is 4 points apart from the roof bottom (ceiling) and the wall. A window is a 3×2 grid. The frame and the horizontal grid line of the window are marked using '=', the vertical grid lines are marked using '+', and the glass of window is of size 3×3 marked using ' '. The horizontal space between a window and the door is 2 points and the space between the low end of the door and the floor is 2 points. Calculate the size of the door. Verify the size of the door is at least of 12 points wide and 16 points high; otherwise, the house design is invalid. Use '@' to mark the points of the door. Write a C program to show the design of the house and draw a house of your design.

Write comments in your program solution as much detailed as possible. Also, write a report to explain your design of the house and the working experience of your program solution such as the process how you develop your house design and problems you encounter. Homework assignment 1 is due by **11:59 pm, Sunday, October 1**. 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)

