Programming Assignment 1: Draw House

- **How to verify a valid design of the house**

  I've done the verification in my code. Calculate the values of total_width, total_height, exterior_width, exterior_height, interior_width, and interior_height, first. If the values are all correct then the house design is valid, else the house design is invalid.

- **The working experience of my program solution.**

  1. The process

     First, I read the descriptions of the house design and turned the words into a sketch so it was easier for me to understand the program. Then, I found that the house could be separated into two parts, one was the roof and the other was the main body of the house, including two windows and a door. I decided to do the roof first. For the roof it could further be seen as three different parts, the top, the middle(side), and the bottom. I thought the middle was the most difficult part and it also took me the longest time to finish it. It was quite similar to drawing a triangle, but there were still some differences. To me, finding the formula that matches every row was the hardest. After the roof part was done, I moved to the body part of the house. At first, I wanted to divide it into three sections, one was the ceiling and the space between the ceiling and the door, another was the windows and the door, and the last part was the rest of the door and the floor. However I figured out that I could combine all of them in a for loop and use if else to separate the different lines. Also for each row, I used if else to determine the location and print out the corresponding character. For example, if it came to the frame part of the window, print "=", and if it was at the door part, print "&". By using for loop, if else and also some arithmetic operators, I finally printed out the house and finished the program.

  2. Problems I encountered

     The first problem was I couldn't find the equation when printing the side part of the roof. I tried many times but it just failed to meet my expectations. The solution I used was to count all the characters of each row and write down the number to find the regularity between them. The second problem was that when I put if else in a for loop, it couldn't function properly and showed that the loop couldn't stop correctly. After I went through my code again and again, I finally found that I put only one "=" to the equality, but the right form is "==". For the third problem, when I put the verification in my code, the outcome became invalid. It took me a lot of time to find the error and finally the result was that the equation of exterior_width was incorrect. I forgot to

include the width of the windows when counting the total number. I will be more careful next time to prevent this kind of mistake. The last problem was I couldn't declare the variable total_width correctly. The solution was I wrote a code to compare the value of r_bottom and exterior_width first, then defined total_width as equal to the bigger one.