D1265154 Mina 曾郁珊 C programming report:

1. Here's a breakdown of the program's structure:

   (1) Constants: The program defines various constants to represent dimensions and sizes of different parts of the house, such as the roof, door, window, and wall. These constants are used to calculate and print the house's components.
   (2) Printing design parameters: The program prints out the design parameters of the house to the console, showing the values of the constants defined at the beginning.
   (3) Roof Printing: The program uses loops to print the roof of the house. It starts with spaces for indentation and then prints the roof using '#' and '*' characters.
   (4) Wall Printing: The program prints the exterior and interior walls of the house, including the space for doors and windows. It uses '@' characters to represent the walls.

2. The problem I encounter in designing this programming
   (1) Character Positioning: One of the main challenges was determining the correct positions for characters to draw different parts of the house, such as the roof, walls, windows, and doors. This required careful calculations and consideration of the dimensions and spacing between these components.
   (2) Variable Naming: Choosing meaningful variable names to represent different dimensions and spaces within the house was essential for code clarity. Selecting appropriate names that accurately conveyed their purpose was a consideration throughout the design process.
   (3) Coordination of Dimensions: Coordinating the dimensions of the house components, such as the roof, windows, and doors, to fit together seamlessly and create a coherent house structure required careful planning and attention to detail.
   (4) Debugging and Testing: Debugging the code to fix issues with character placement, loop conditions, and calculations process. Testing the program step by step and gradually building the house helped identify and resolve problems.

3. To verify a valid design of the house

```
if (h_total_width == h_total_width && h_total_height == h_total_height) {
        printf("\n***** The house design is valid:\n");
        printf("      >>> The total width of the house: %d\n", h_total_width);
        printf("      >>> The total height of the house: %d\n", h_total_height);
        // verify other dimensions
    } else {
        // Invalid design
        printf("\n***** The house design is not valid. Dimensions do not match
expected values.\n");
    }
```