세계 속의 빛 광주과학기술원

Computer Programming

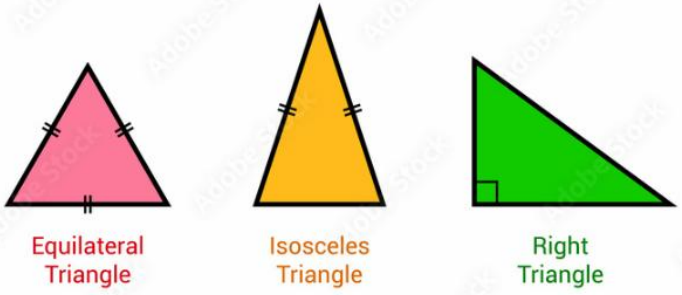
Lab2

Mar 18, 2025

Ex1

- Write a program to determine the following triangles.
  - ✓ The user is asked to input three numbers. The three numbers are integers greater than or equal to 1 and less than or equal to 100.
  - ✓ Equilateral triangle: All three sides have the same length.
  - ✓ Isosceles triangle: Two sides have the same length. (However, equilateral triangles are not included in isosceles triangles.)
  - ✓ Right triangle: The sum of the squares of the two right sides must be equal to the square of the hypotenuse.
  - ✓ General triangle: A triangle that does not satisfy any of the above conditions.
  - ✓ The conditions for forming a triangle are as follows.
    - When the lengths of three sides a, b, and c are given, the conditions for them to form a triangle are as follows:

      $a + b > c$, $a + c > b$, $b + c > a$
    - A triangle can be formed with a, b, and c only if all three of these conditions are satisfied. If even one of them is not satisfied, the triangle cannot be formed.



Ex1

- **Program output**

```
[ohyong@cse Lab2]$ vi ex2_1.c
[ohyong@cse Lab2]$ gcc ex2_1.c -o ex2_1
[ohyong@cse Lab2]$ ./ex2_1
Enter three integers A, B, and C: 3 4 5
Right Triangle
```

```
[ohyong@cse Lab2]$ ./ex2_1
Enter three integers A, B, and C: 2 2 3
Isosceles Triangle
```

```
[ohyong@cse Lab2]$ ./ex2_1
Enter three integers A, B, and C: 5 5 5
Equilateral Triangle
```

```
[ohyong@cse Lab2]$ ./ex2_1
Enter three integers A, B, and C: 3 4 6
General triangle
```

```
[ohyong@cse Lab2]$ ./ex2_1
Enter three integers A, B, and C: 1 2 3
This is not a valid triangle.
```

Ex2

- Suppose you are the manager of the student dormitory in GIST and according to students' feedback, they prefer rooms that need less walking time from the elevator. Your task is to allocate rooms to students according to this preference.
- The student dormitory is a rectangular building H-storey tall with W rooms on each floor ($1 \leq H, W \leq 99$). There is only one elevator and it is on the leftmost side of the building (see Figure L2). You may assume that the distances between neighboring rooms are all the same.

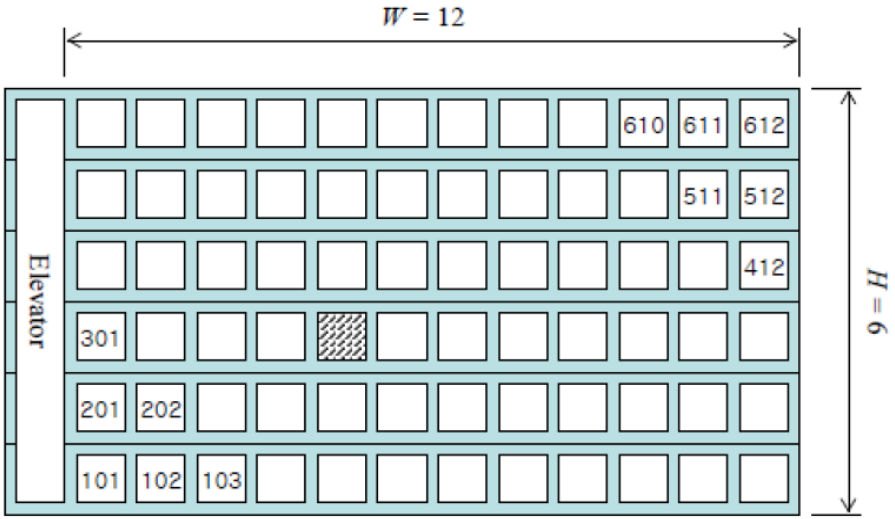


Figure L2. An example of an $\boldsymbol{H} \times \boldsymbol{W}$ dormitory where $\boldsymbol{H} = 6$ and $\boldsymbol{W} = 12$

Ex2

- The rooms are numbered in YXX or YYXX style where Y or YY denotes the floor number and XX, the index of the room counting from the left. Therefore, the shaded room in Fig. L2 will have a room number of 305.
- The students are not concerned with the vertical distance moved in the elevator, but if walking distance is the same, the students prefer rooms on the lower floors rather than the higher floors. For example, the room 301 is preferred to the room 102 since the student should walk for two units to room 102 instead of one unit for room 301. In addition, the room 2101 is preferred to the room 102.
- Your task is to write a program that will read in 3 integers *H*, *W* and *N*, and compute the room number that should be assigned to the N^{th} student, assuming that all the rooms are vacant initially. The first student should be assigned to 101, the second student to 201, and so on. In Fig. L2, for example, the 10^{th} student should be assigned to room 402 since H=6.

Ex2

- **Program output**

```
[ohyong@cse Lab2]$ vi ex2_2.c
[ohyong@cse Lab2]$ gcc ex2_2.c -o ex2_2
[ohyong@cse Lab2]$ ./ex2_2
Enter H, W and N : 6 12 10
N : 10 ---------> Student's room number : 402
```

```
[ohyong@cse Lab2]$ ./ex2_2
Enter H, W and N : 64 20 100
N : 100 ---------> Student's room number : 3602
```

Submission

- **Submit to server**

Lab #

Class #

At the end of the Lab2, submit your C sources file by typing

~gs1401/bin/submit Lab2_2 ex2_1.c ex2_2.c // by Thur. 11:50

~gs1401/bin/submit Lab2_3 ex2_1.c ex2_2.c // by Friday 10:50

~gs1401/bin/submit Lab2_4 ex2_1.c ex2_2.c // by Friday 11:50

~gs1401/bin/submit Lab2_5 ex2_1.c ex2_2.c // by Friday 13:50

You may check that you have submitted your source code correctly by typing

~gs1401/bin/submit -check