**Calculate the Height of the building (End User Story)**

The plays who woke up at the 3rd floor in the hospital room, discovered that the door is blocked and not just locked, he looks out the window and decided to make some rope with all sheets he can find at the room. To decide how long the rope need to be, he needs to calculate the height of the building from the window to the ground following the formula H = S0t + ht2/2

**Task**: Calculate the height of the medical building.

**Inputs:**

Initial speed: The initial speed of the object;

Gravity speed: The gravity speed in meters per seconds;

Total Time: The time the objet take to hit the ground;

**Output**: The Height of the building in meters;

**Validation Rules:**

The “initial speed” of the object must be zero in order to the calculus to be more precise;

Gravity speed must be 9,8 m/s2;

The “total time” until the object hit the ground must be an integer number.

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| calcBuildingHeight Test Matrix | | | | | | | |
|  | Test Cases | | | | | | |
| Valid | Invalid | | | Boundary | | |
| 1 | 2 | 3 | 4 | 5 | 6 | |
| Inputs | | | | | | | |
| Initial Speed | 0 | 1 | 0 | 0 | 0 | 0 | |
| Gravity Speed | 9,8 m/s² | 9,8 m/s² | 8,8 m/s² | 9,8 m/s² | 9,8 m/s² | 9,8 m/s² | |
| Total time | 2 | 2 | 2 | 1,5 | 2 | 1 | |
| Outputs | | | | | | | |
| height | 19,6 | -1 | -1 | -1 | 19,6 | 9.8 | |
| Error |  | Initial Speed different than 0 | Gravity speed different than 9,8 m/s² | Total time isn´t an integer |  |  | |

**Algorithm**

calcBuildingHeight(initialSpeed,gravitySpeed,totalTime): double

BEGIN

IF (initialSpeed <> 0) THEN

RETURN -1

IF (gravitySpeed <> 9,8) THEN

RETURN -1

IF (totalTime <> integer) THEN

RETURN -1

height = (initialSpeed \* totalTime) + (9,8\*(totalTime)2) / 2;

RETURN height

END