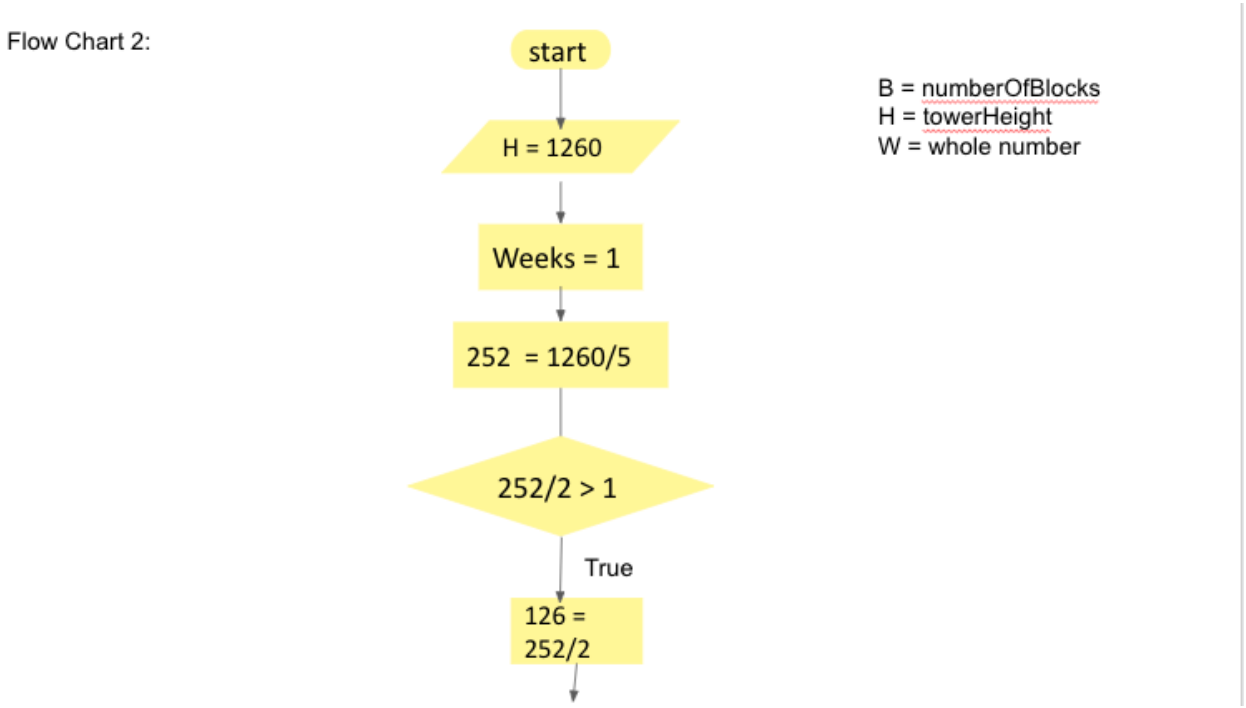
Tenzin Chime and Grace Wang

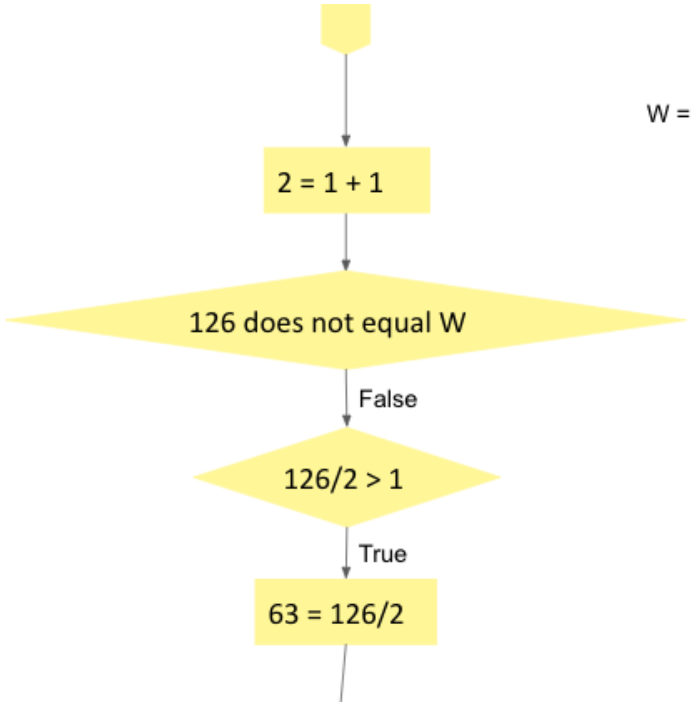
(1) flowchart representation of your algorithm to build a 1260-meter high skyscraper, and show the shortest amount of time that it will take to build the 1260-meter high tower using your algorithm.

- It will take a minimum of 13 weeks to build a 1260-meter high tower

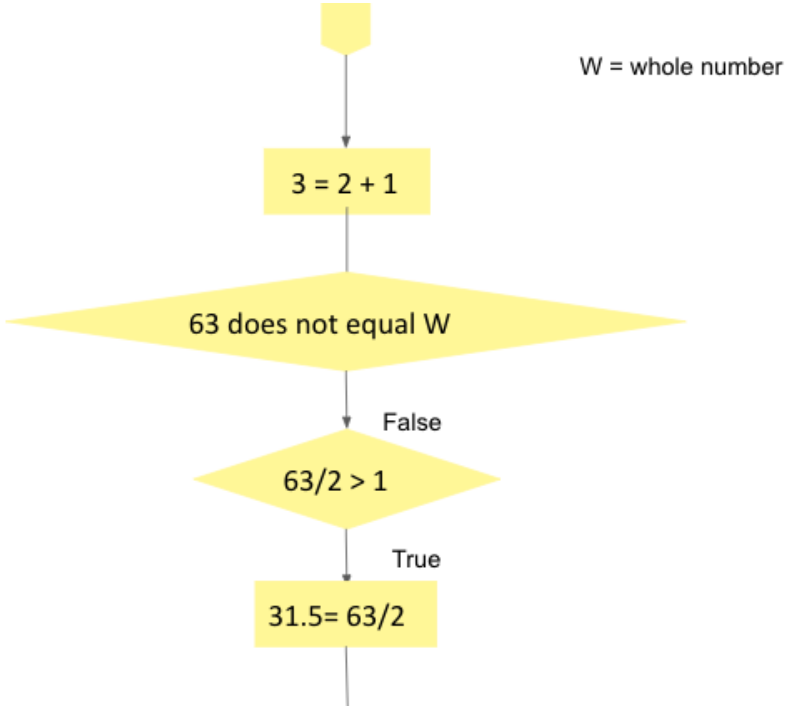
Flowchart Representation:

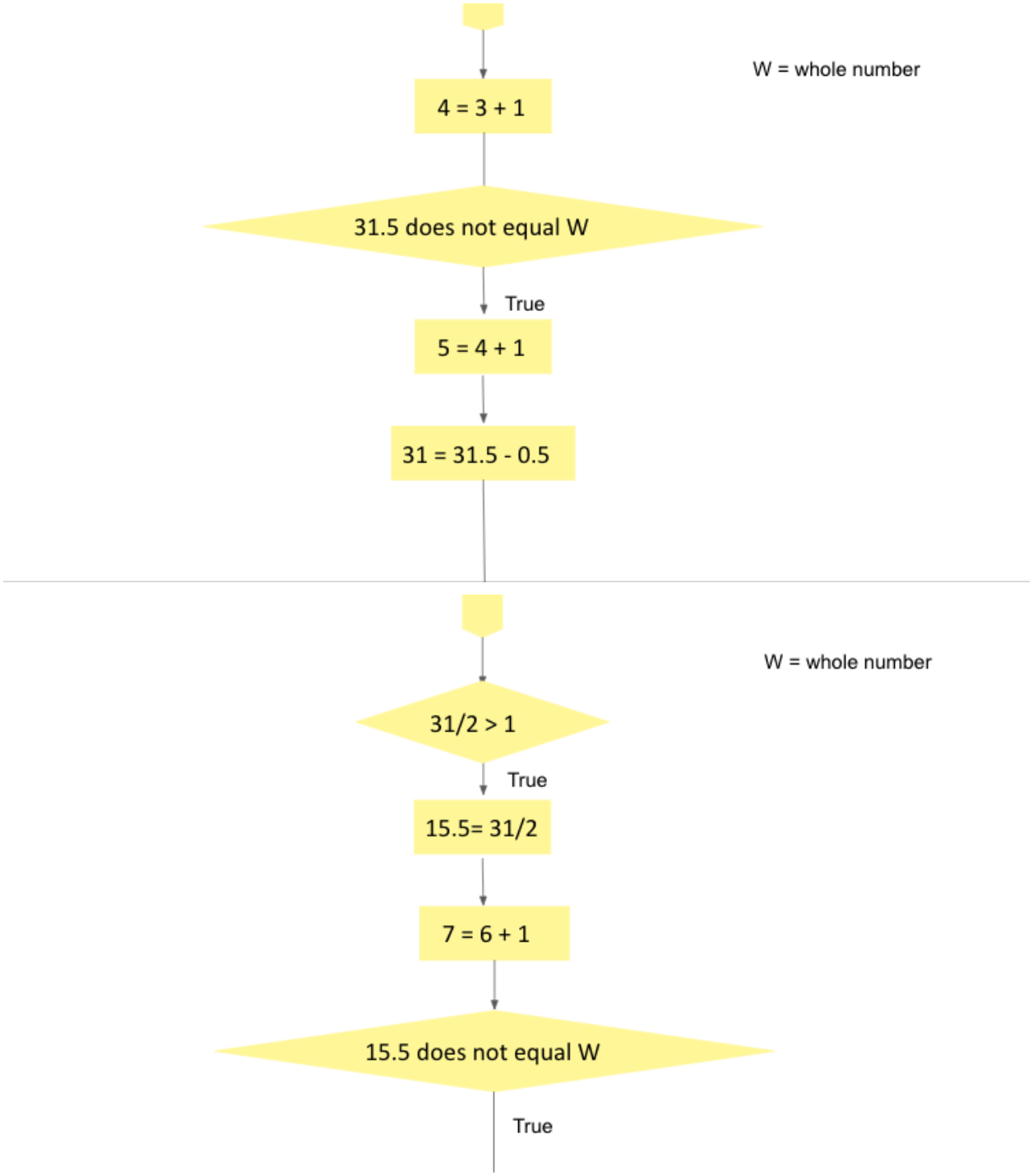


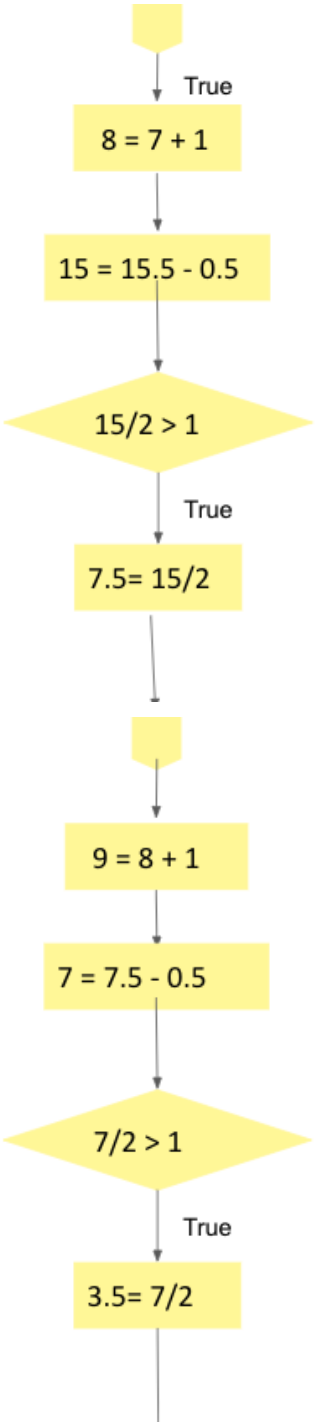
Flow Chart 2:

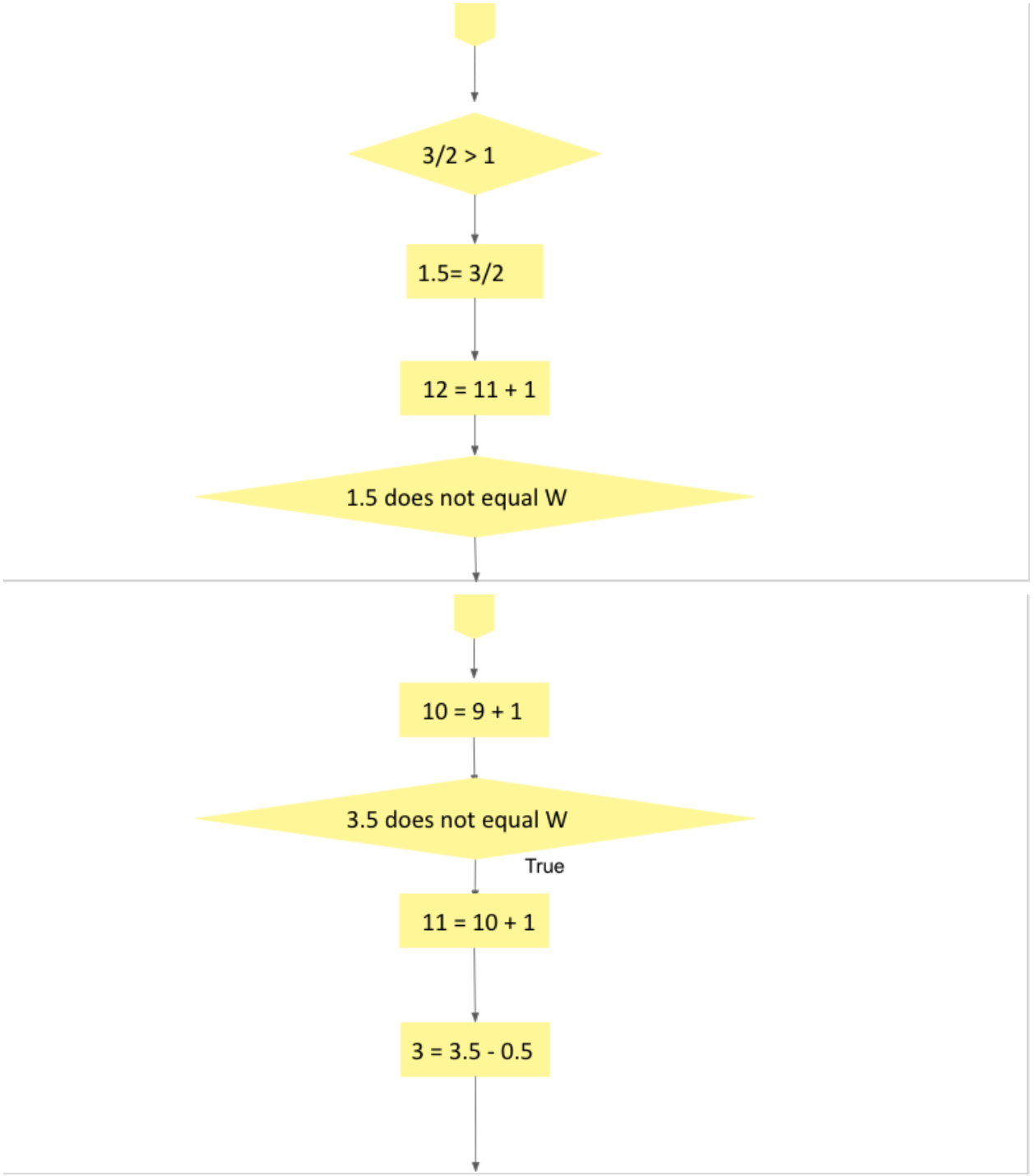


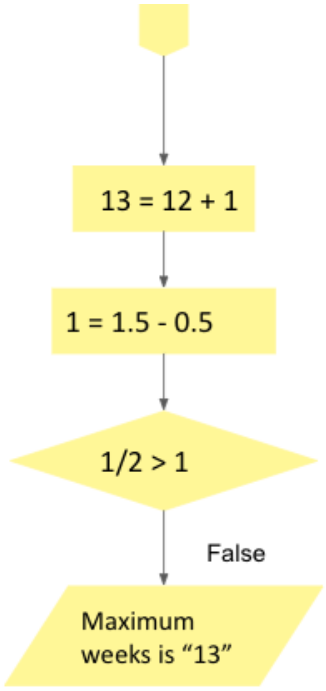
Flow Chart 2:




W = whole number
4 = 3 + 1
31.5 does not equal W
True
5 = 4 + 1
31 = 31.5 - 0.5
W = whole number
31/2 > 1
True
15.5= 31/2
7 = 6 + 1
15.5 does not equal W
True


True
8 = 7 + 1
15 = 15.5 - 0.5
15/2 > 1
True
7.5= 15/2
9 = 8 + 1
7 = 7.5 - 0.5
7/2 > 1
True
3.5= 7/2


3/2 > 1
1.5= 3/2
12 = 11 + 1
1.5 does not equal W
10 = 9 + 1
3.5 does not equal W
True
11 = 10 + 1
3 = 3.5 - 0.5



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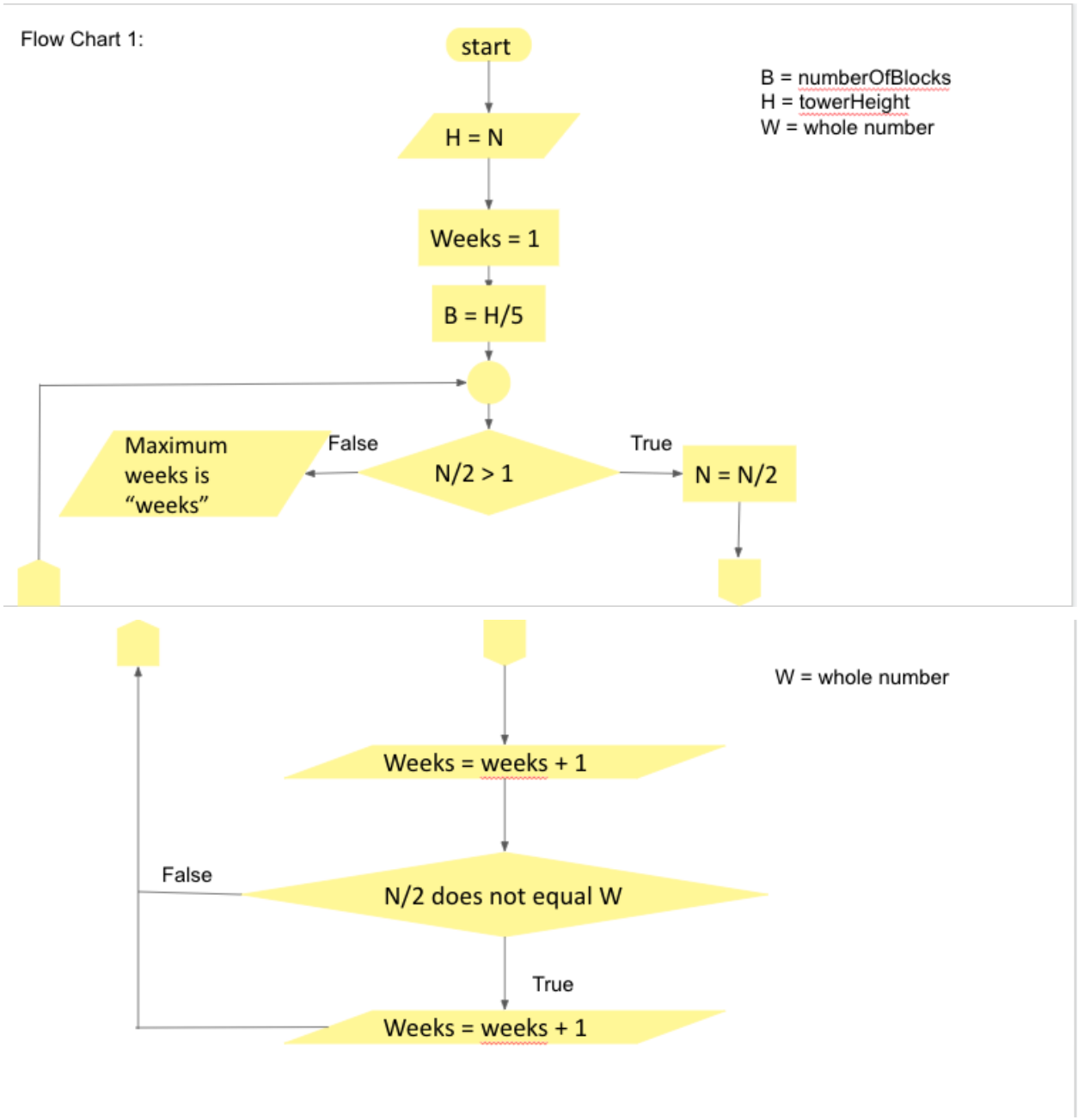
(2) Include a general algorithm in flowchart and pseudocode representations for skyscrapers of N-meter high (where N is a multiple of 5).

Pseudocode Representation:

```
Input N
TowerHeight = N
Let weeks = 1
numberOfBlocks = towerHeight/5
While numberOfBlocks/2 > 1
        numberOfBlocks = numberOfBlocks/2
        weeks = weeks + 1
        If numberOfBlocks does not equal whole number
                Then weeks = weeks + 1
                Then numberOfBlocks = (numberOfBlocks) - 0.5
        End-if
End-While
Display “Maximum weeks is:” weeks
```

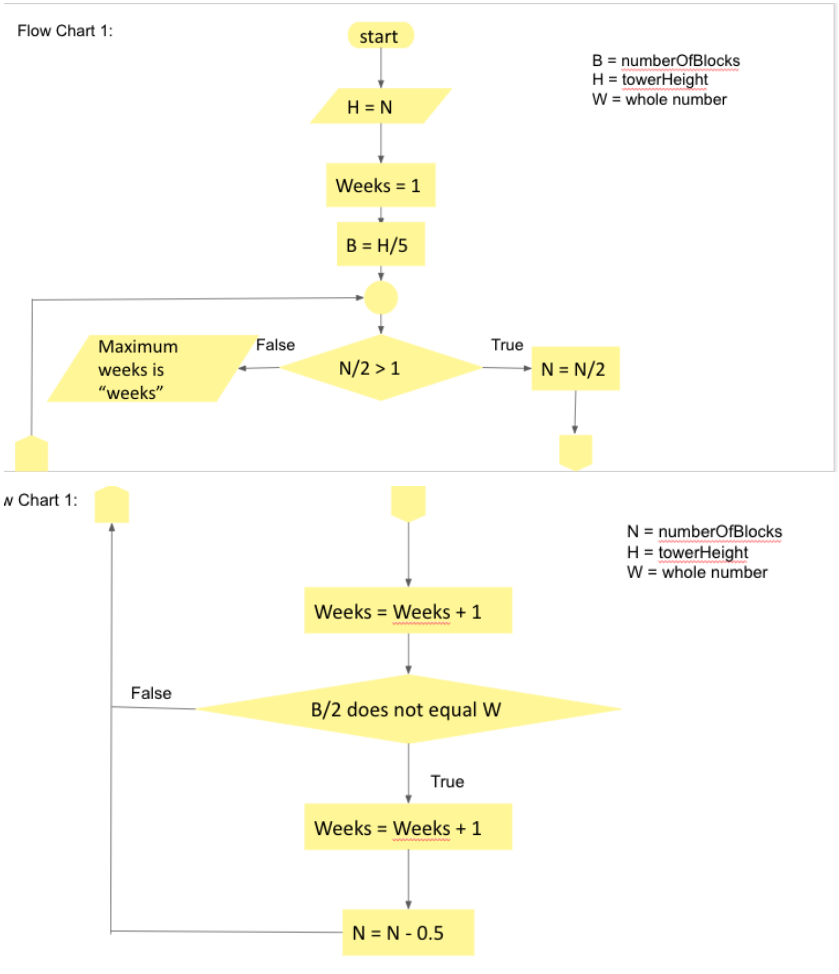
Flowchart Representation:



For the Algorithms for Skyscrapers project we started with creating the overall idea of how the skyscraper would be built by visually drawing it out. We noticed the basic pattern taking place and created a loop based on that pattern. This was the pseudocode we created:

```
Let TowerHeight = N
Let weeks = 1
numberOfBlocks = towerHeight/5
While numberOfBlocks/2 > 1
        numberOfBlocks = numberOfBlocks/2
        weeks = weeks + 1
        If numberOfBlocks does not equal whole number
                Then weeks = weeks + 1
                Then numberOfBlocks = (numberOfBlocks) - 0.5
        End If
End While
Display: “Maximum weeks is:” weeks
```

After noticing the pattern that took place when getting the overall idea with how to deal with remainders and decimal values, we made sure to test the algorithm many times to make sure it was accurate. We did this by trying it out with other numbers because this algorithm was made to perform the same procedure with any number. Once the algorithm worked, we then reflected it into a flow chart so that it was mapped out in a visual way. This is how it looked:



Finally, we replaced the variable N with the tower height we were assigned: 1260 meters, and went through our flowchart step by step, demonstrating how the loop occurs from our algorithm in pseudocode. We ended up with the same output as our pseudo code, proving that our flowchart is accurate, and can be used with any number N.