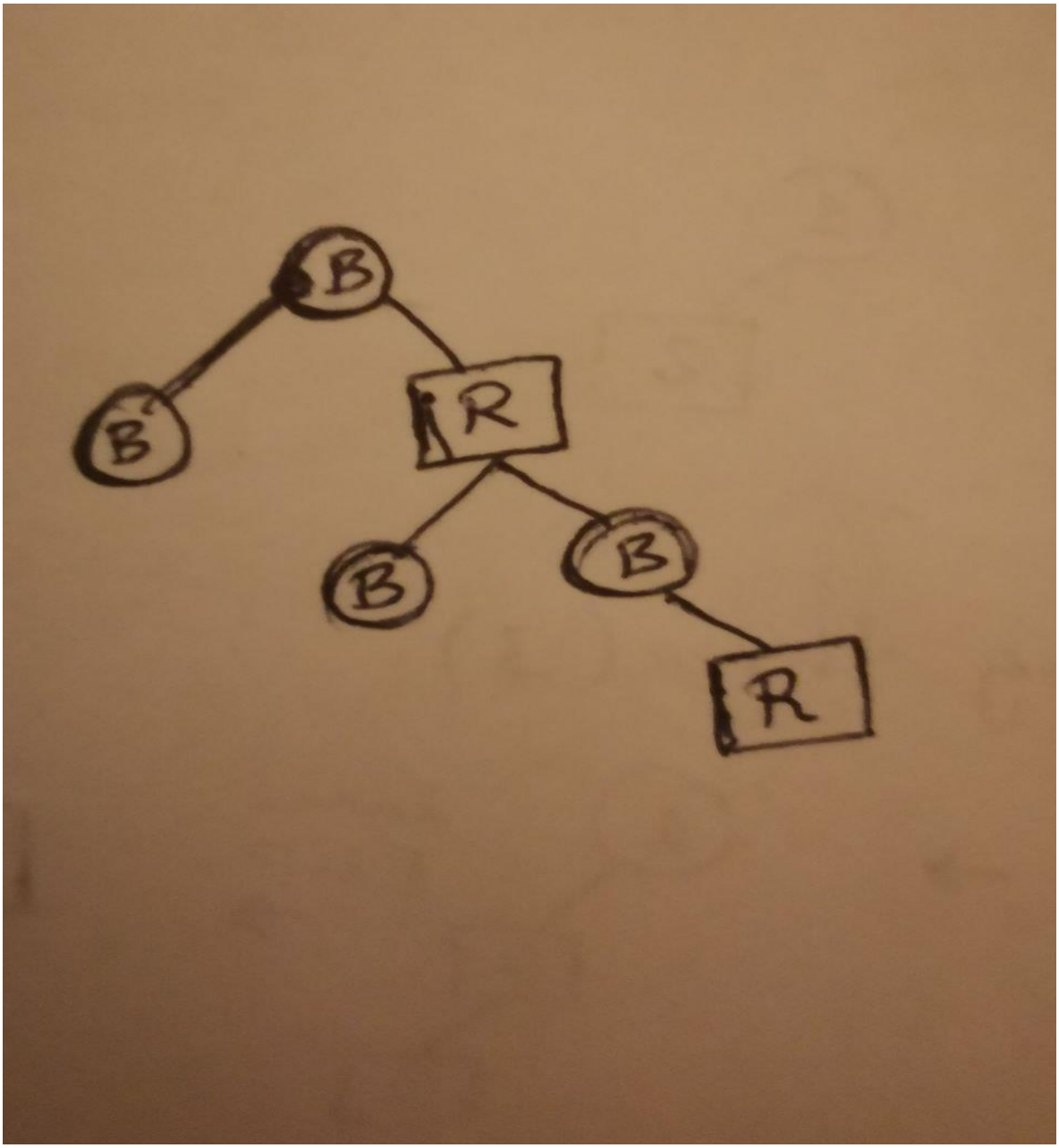
Lab assignment solution

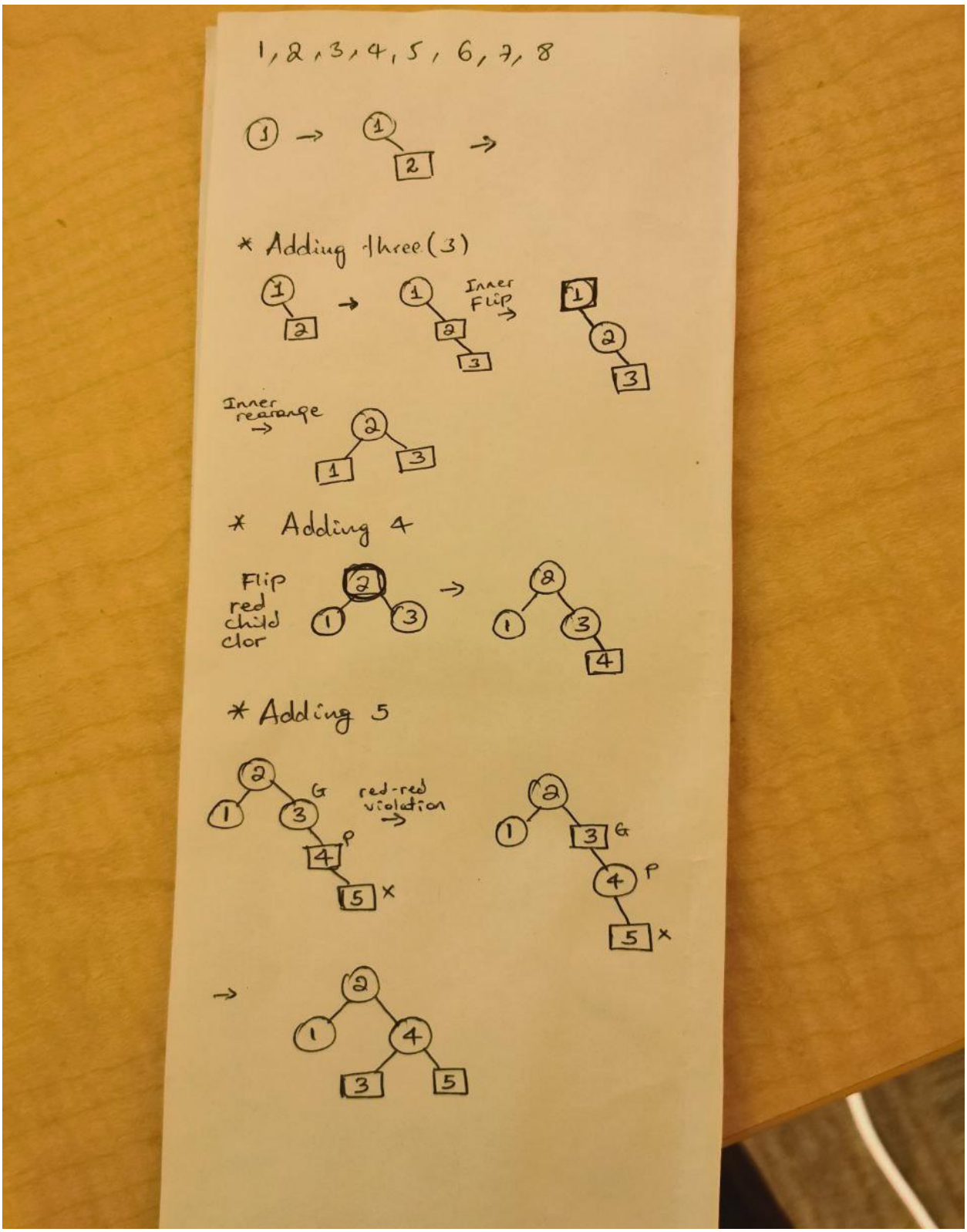
Problem 1:

The root node has 1 height if the path taken is the left most nodes, but a height of 3 if the path taken is the right most sides. 3-1>1, which violates AVL

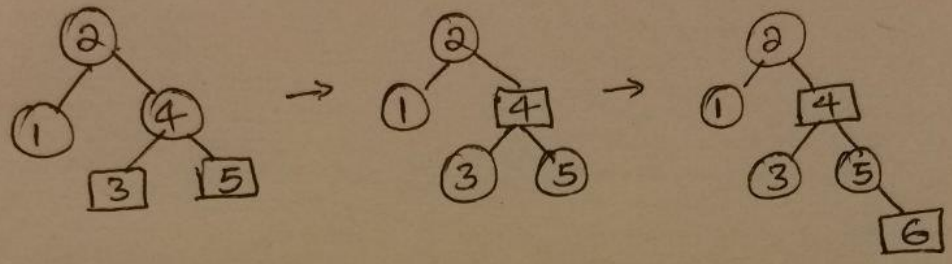


Problem 2:

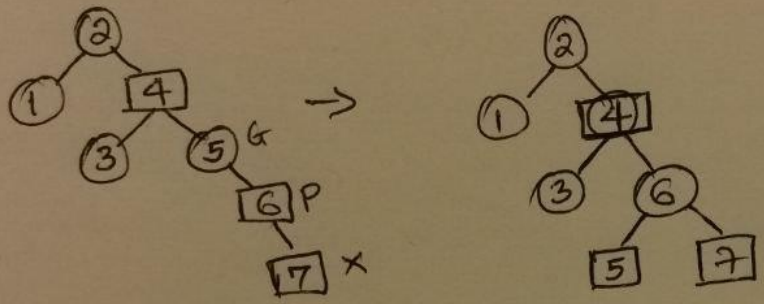
Inserting 1,2,3,4,5,6,7,8



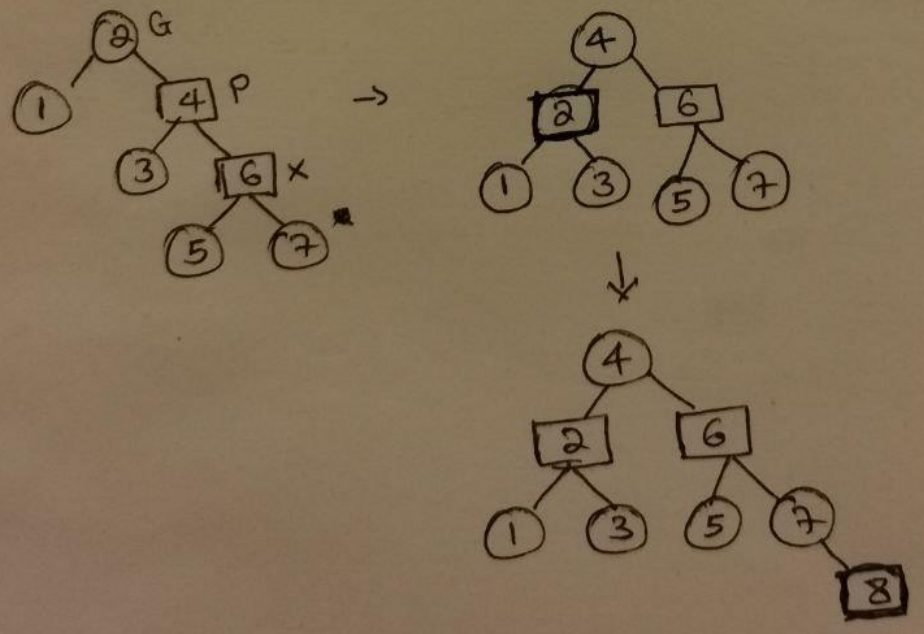
* Adding 6



* Adding 7



* Adding 8



Problem 3:

```
Algorithm isPrime(n):
    Input: a positive integer n>1
    Output: boolean, check whether n is a prime
    s ← ceiling(sqrt(n))
    for( i ← 2 to s)
        if(n mod i = 0)
            return false
    return true
```

The asymptotic running time is $O(\sqrt{n})$ as the for loop runs $\sqrt{n}$ times.

```
public class PrimeCheck {
    public static boolean isPrime(int n) {
        if(n<2)
            return false;
        int s = (int) Math.ceil(Math.sqrt(n));
        for(int i=2; i<=s; i++) {
            if(n%i==0)
                return false;
        }
        return true;
    }
}
```