```
// EXAMPLE 1
// log base 2 calculator

int logBase2(int n){
  int ret = 0;
  while(n > 1){
    n /= 2;
    ret++;
  }
  return ret;
}
```

Use Big-O notation, describe the worst case running time of the above function.

```
// Example 2
// Moving Average function
int * movingAverage(int * data, int n, int window_size){
  int * ret = new int[n];
  int half_window = window_size / 2;
  for(int i = 0; i < n; ++i){
    int sum = 0;
    int num_counted = 0;
    for(int j = i - half_window; j < i + half_window; ++j){
      if(j >= 0 && j < n){
        num_counted++;
        sum += data[j];
      }
      ret[i] = sum / num_counted;
    }
  }
  return ret;
}
```

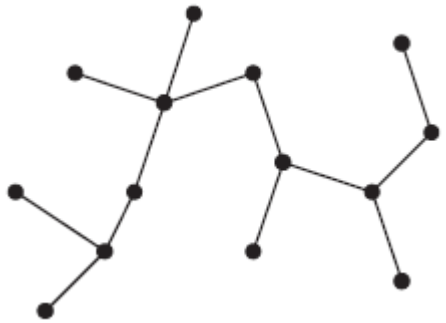
What is the worst case complexity of this function ?

```
1  void bubbleSort(int * array, int n){
2    for(int i = 0; i < n; ++i){
3      for(int j = i + 1; j < n; ++j){
4        int lhs = array[i];
5        int rhs = array[j];
6        if(rhs < lhs){
7          array[i] = rhs;
8          array[j] = lhs;
9        }
10     }
11   }
12 }
```

13

14 **What is the worst case complexity of this function ?**

Represent th given Tree T Formally.



Represent th given Graph G Formally.