Assignment 9 Time Efficiency Analysis

In the FindInOutDegree method, the first outer loop go through all the keys in the adjacency list. The first inner loop go through all the edges in the keys to find all the out degrees, which is at worst O(|E|). The second inner loop within the first outer loop go through all the edges |V| times to get the in degrees, so it’s O(|V|\*|E|) at worst. The second different nested loop go through all the edges to find the vertices that has only in degrees, it go through all the edges so it’s O(|E|). The third nested loop go through all the edges for all the in degree only vertices, it’s at worst O(|V|\*|E|). The O(|V|\*|E|) dominates the running time so the algorithm for FIndInOutDegree is O(|V|\*|E|).