

# Assignment 5: Dynamic Programming (graphs) and Greedy Algorithms (spice)

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## 1 ASYMPTOTIC RUNNING TIME

### 1.1 SINGLE SOURCE SHORTEST PATH (SSSP)

The asymptotic running time of SSSP is  $O(VE)$  where  $V$  is the number of vertices and  $E$  is the number of edges. This is because the code has a for loop to go through each vertex and then a nested for loop to go through all of the edges in the graph.

### 1.2 FRACTIONAL KNAPSACK (SPICE)

The asymptotic running time of Fractional Knapsack is  $O(n^2)$  because this is the time complexity of Selection sort, which was my method of sorting the spices based on unit price.