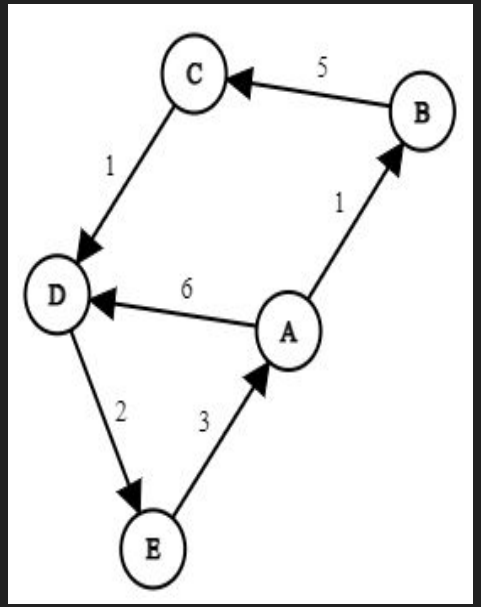
Input

- The input of our problem would consist of the following parts;
  1. A weighted directed graph of indeterminate size.
  2. A text file with the preferred starting node.

NP-Completeness

- Certification process can be done in polynomial time
  - Given a graph G and a path P within G, iterate over all edges within the path and sum up the edge weights (this is Θ (n), where n is the number of edges along the path).
  - Then, simply evaluate whether or not the sum equals L (constant time).



Let P = A->D->E
Let L = 9

1. Sum weights of all edges:

A->D = 6
D->E = 2
Total = 8

2. Does Total = L?

No. 8 ≠ 9

NP-Completeness

- Reduction from Hamiltonian Path problem:
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Test Cases