Traveling Salesman Problem (TSP)

- Brute Force: Always gives the best possible answer

  BUT way too many things to check - takes forever

  ↑ very inefficient!

  Some better methods exists to find best possible route (exponential rather than factorial)

  Still inefficient.

- Nearest Neighbor (and repeated NN)

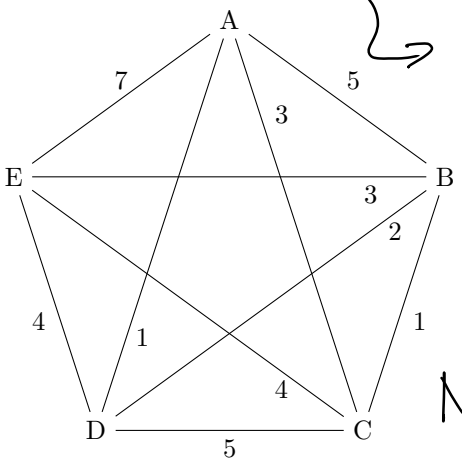
  Much more efficient, but doesn't always give the best route.

- Sorted Edges Algorithm

  Also efficient, but doesn't always give the best route.

The Sorted Edges Algorithm

sorted edges



Write out the weights in increasing order

1, 1, 2, ~~3~~, ~~3~~, 4, ~~4~~, ~~5~~, ~~5~~, 7

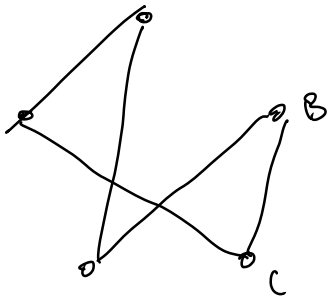
Pick edges starting with least weight.
(don't worry where to start, or if they are connected)

Never make a subcircuit,
never choose 3 which meet.

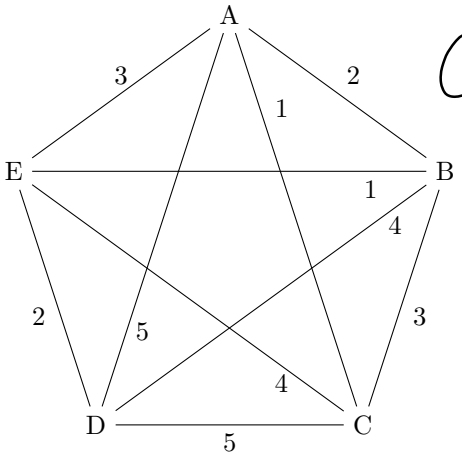
Write the answer starting from where you want.

"Use SE to find a circuit at B"

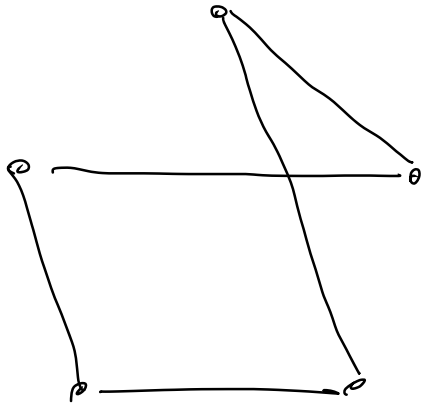
BCEADB



Use the sorted edges algorithm to find a good Hamilton circuit starting and ending at A:

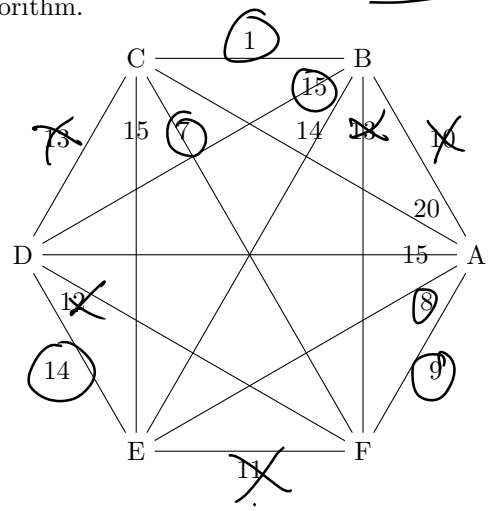


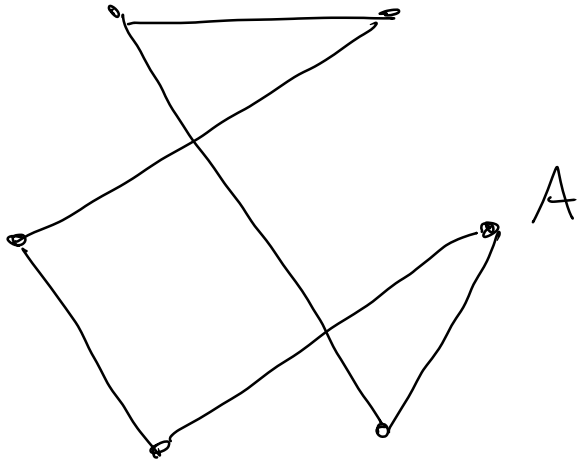
1, 1, 2, 2, 3, 3, 4, 4, 5, 5



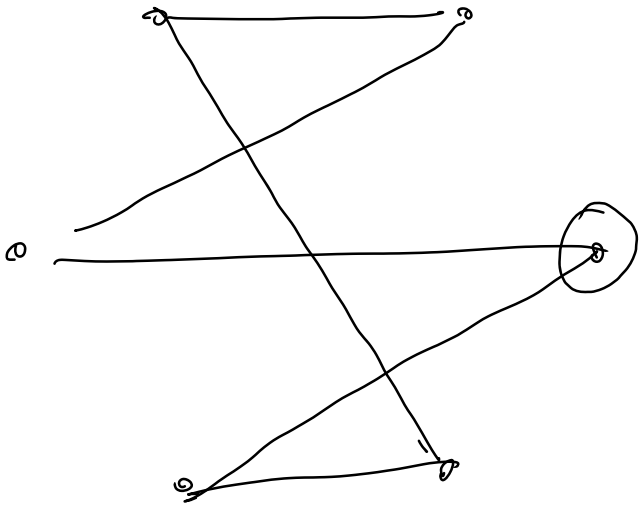
ABEDCA

Find a good Hamilton circuit starting at A using the Nearest Neighbor algorithm, and the Sorted Edges algorithm.





AFCBDEA



NN