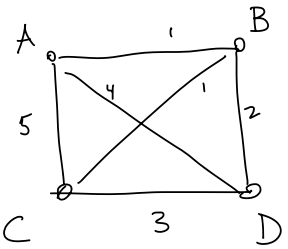
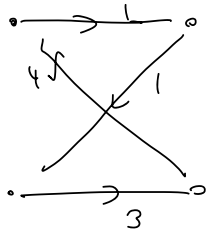
Nearest Neighbor



NN starting at A:

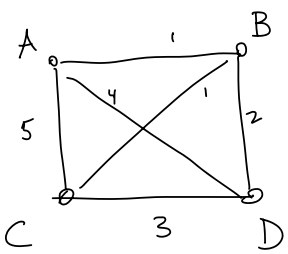


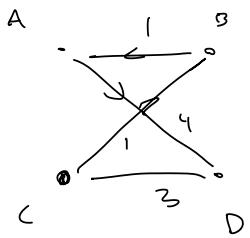
ABCDA

total is
1+1+3+4 = 9.

If matters where we start!

Start at C:

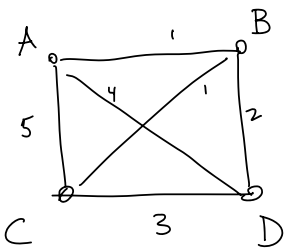


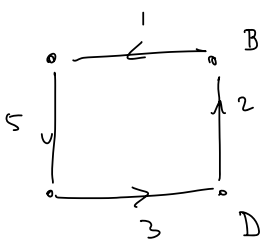


same as above.

CBADC

Start at D:





different!

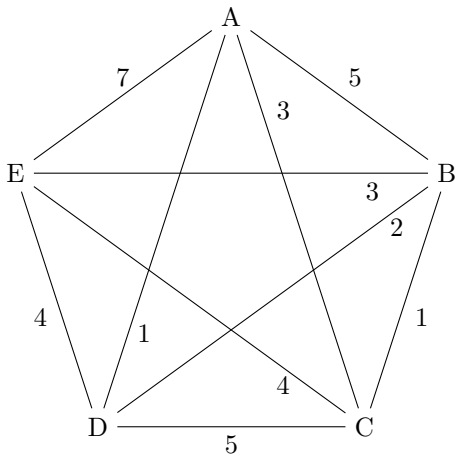
DBACD

2+1+5+3 = 11

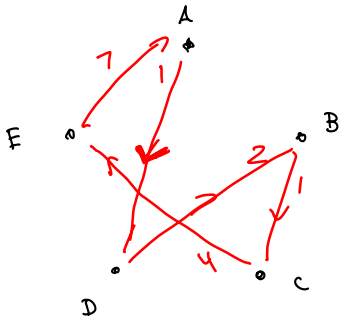
So NN gives different answers depending where you start.

The Repeated NN algorithm

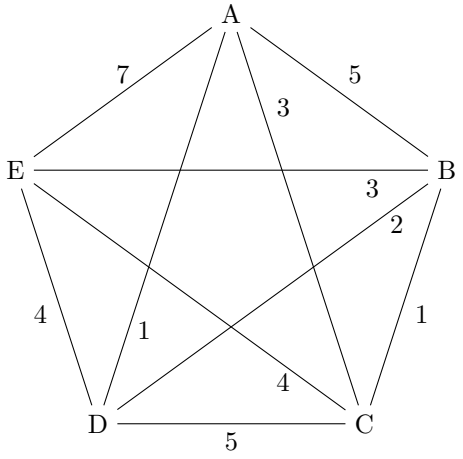
Choose each different starting pt,
do NN for all of them.
Choose the best overall.



Find the circ using NN at A.

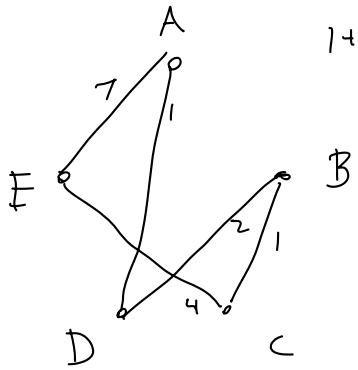


ADBCEA → 15



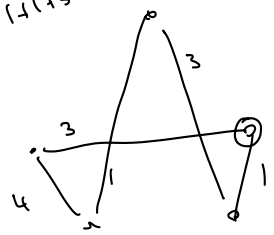
Repeated NN.

A:



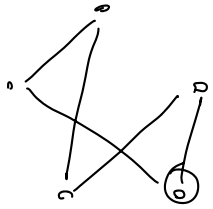
1+1+2+4+7 = 15

B:



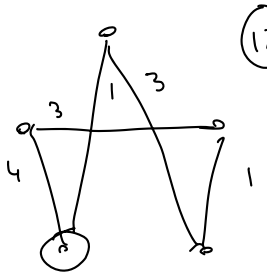
1+1+3+3+4 = 12

C:



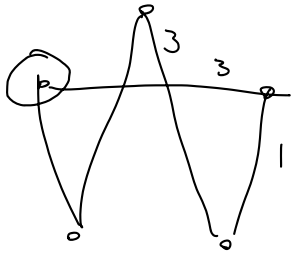
15

D:



12

E:



12

Best one has total weight 12,

BCADEB

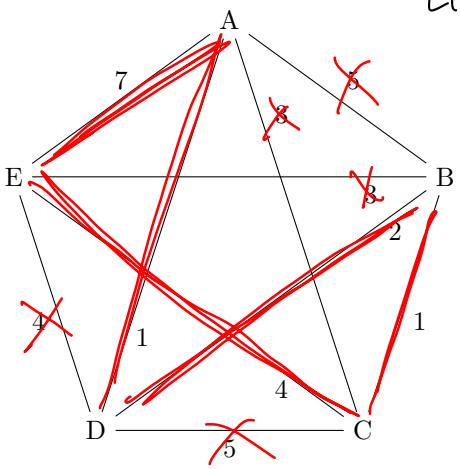
Sorted Edges Procedure

Another way to get good circuits in a TSP.

The Sorted Edges Algorithm

(No starting point) pick individual edges in order

List out the edges from least to greatest weight



3-way subcircuit.

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

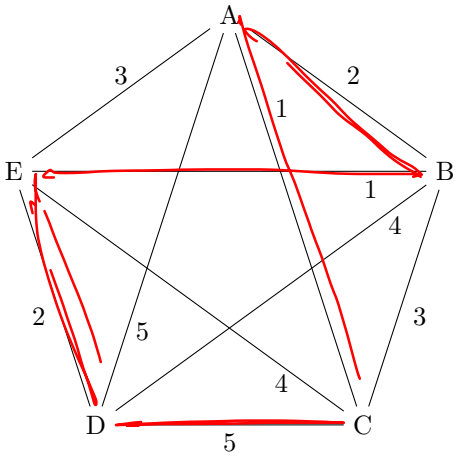
Choose edges one at a time, least to greatest,

Never make a 3-way intersection or subcircuit

We end up with a circuit visiting every vertex.

Starting at A, it's A D B C E A

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

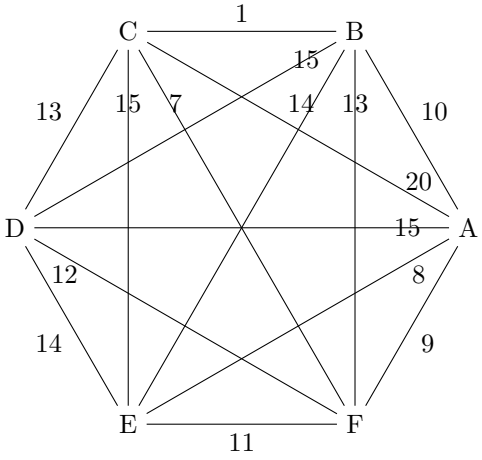


1, 1, 2, 2, 3, 3, 4, 4, 5, 5

A B E D C A

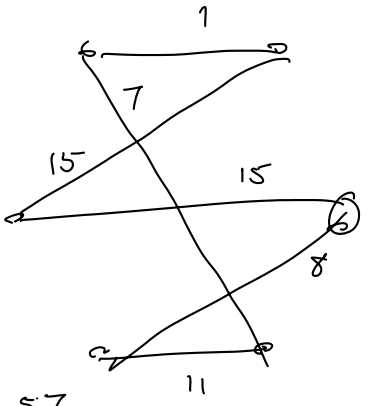
or A C D E B A

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



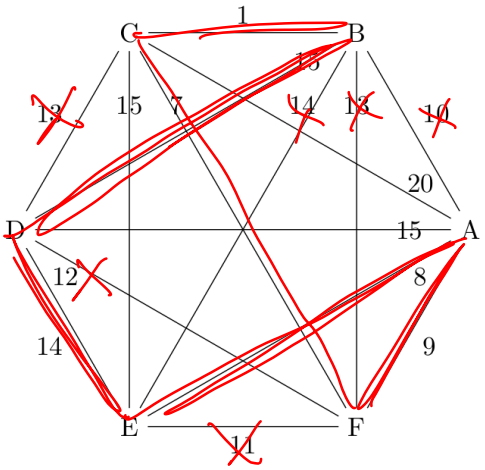
NN at A

A E F C B D A



total = 57

algorithm.



1, 7, 8, 9, 12, 14, 12, 13, 13, 14, 14, 15, 15, 15, 20

AFCBDEA → 54

Last test: New topics:

D1 → D11

(No D12 & D13)