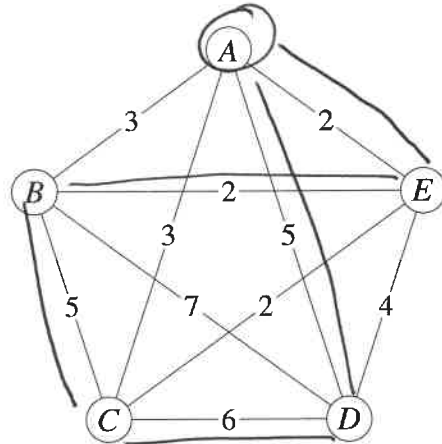


Name: Solutions score: _____ / 10

There are 10 points possible on this quiz. No aids (book, notes, etc.) are permitted. You may use a non-programmable calculator. **Show all work and supporting calculations for full credit. Explain how you get your answers.**

1. (a) (3 pts.) For the graph below, apply the **Nearest Neighbor (NN)** Algorithm starting at vertex A to find a low weight Hamiltonian cycle.



Circuit (List vertices): A E B C D A

Total weight of circuit: 2+2+5+6+5 = 20

- (b) (1 pt.) The repeated Nearest Neighbor (RNN) Algorithm is more work than the NN Algorithm. Why is it still worth doing?

You might find a better (lowerweight) circuit.

- (c) (3 pts.) Describe one real-world situation for which finding a Hamiltonian Circuit in the graph above would be useful.

Vertices represent cities

Edge weights represent cost of flights between pairs

Reason to find a low weight Hamiltonian Cycle:

It would be a cheap way to travel to each
 ↑
low cost

city and return home.

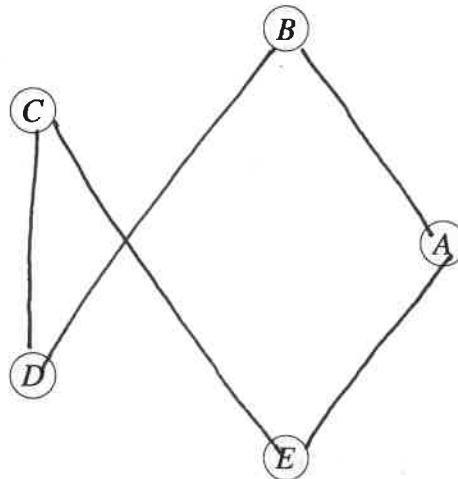
Math F113X: Quiz 6

2. (3 pts.) Use the **Sorted Edges** Algorithm to find a low total weight Hamiltonian circuit for the graph with edge weights described by the following tables. You may find it helpful to draw your circuit using the labelled vertices.

	A	B	C	D	E
A	-	10	15	20	10
B	10	-	35	25	12
C	15	35	-	30	5
D	20	25	30	-	10
E	10	12	5	10	-

Edge	Weight	used?
CE	5	✓
AB	10	✓
AE	10	✓
DE	10	X
BE	12	X
AC	15	X
AD	20	X
BD	25	✓
CD	30	✓
BC	35	

Stop



Circuit (List vertices): ABDCEA

Total weight of circuit: $5 + 10 + 10 + 25 + 30 = 80$