

Homework 5

Math 118 section 004

Due: Friday, March 7th

1. The cost of bus fare between seven cities can be represented as a weighted complete graph with the vertices $Q, R, S, T, U, V,$ and W . The prices for bus trips is given by the fare chart below. Suppose you want to visit all of the cities, via bus, but pay the least amount possible. Answer the following questions.

- (a) Apply the repetitive nearest neighbour algorithm in an attempt to find the least expensive Hamilton circuit. However, only use vertices $R, S,$ and T as starting vertices.
- (b) Apply the cheapest link algorithm in an attempt to find the cheapest Hamilton circuit.
- (c) Comment (i.e. write a short paragraph) on your answers. Consider questions like:

How different are the two approximate solutions? Do you think they are close to optimal? How long did it take? Would you use a different algorithm given the option?

	Q	R	S	T	U	V	W
Q	*	100	83	76	65	91	101
R	100	*	80	75	68	43	79
S	83	80	*	105	119	187	165
T	76	75	105	*	150	137	148
U	65	68	119	150	*	200	170
V	91	43	187	137	200	*	180
W	101	79	165	148	170	180	*

Table 1: Bus fares between cities

Quiz Score	Frequency
0	0
1	0
2	1
3	0
4	0
5	2
6	7
7	3
8	2
9	5
10	6

Table 2: Quiz scores and their frequency

2. A (fictitious) set of quiz scores is given above. Answer the following questions.
- (a) Find the mean and median scores.
 - (b) Find the variance and standard deviation of the data.
 - (c) Draw a bar graph of the scores. Use grade as the horizontal axis (and the number who got that grade as the vertical).
 - (d) Comment on the data (i.e. write a short paragraph). Consider questions like:
Does the data look normally distributed? What does the standard deviation tell you about the data? Can you tell by the mean or median if the class did well?