You are taking "Midterm Exam" as a timed exam. The timer on the right shows the time remaining in the exam. To receive credit for problems, you must select "Submit" for each problem before you select "End My Exam".

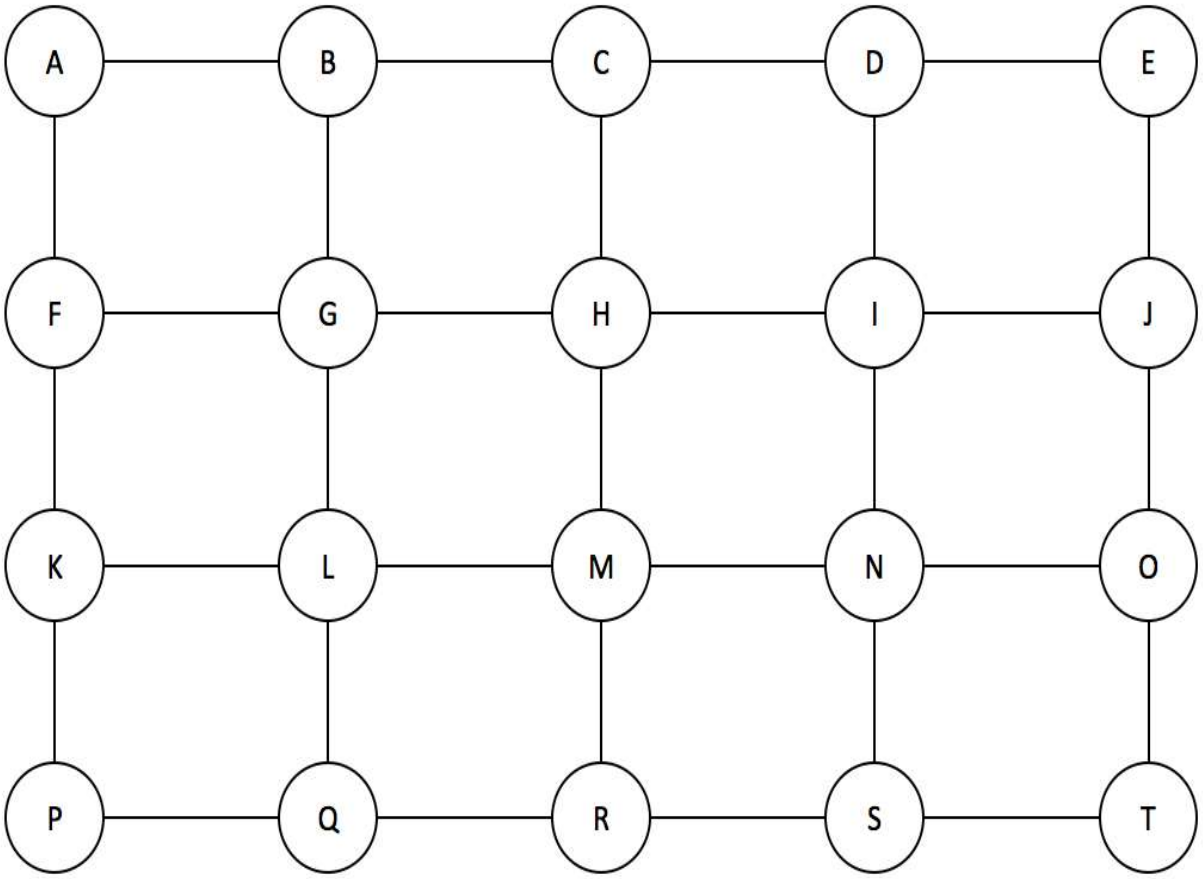
End My Exam 1:32:08

Problem 3

Question 1.

15/15 points (graded)

You work for the company Tasty Syrup. Tasty Syrup imports its syrup from overseas, and you are in charge of its delivery from the origin state to the destination state. Please find the shortest route to truck the syrup. The illustration below shows a map of the relative state locations. It is not drawn to scale.



Edge Connection	Weights
A-B	456
A-F	167
B-C	314
B-G	328
C-D	400
C-H	165
D-E	257
D-I	153
E-J	146
F-G	249
F-K	312
G-H	228
G-L	255

H-I	323
H-M	111
I-J	441
I-N	107
J-O	261
K-L	385
K-P	103
L-M	159
L-Q	108
M-N	155
M-R	333
N-O	397
N-S	486
O-T	451
P-Q	266
Q-R	311
R-S	483
S-T	110

Please select the shortest path from E to Q.
Please use "-" between different nodes in your shortest path. For example if your shortest path is ABC, then enter A-B-C as your answer. Include the starting and the ending node in your answer.

E-D-I-N-M-L-Q ✔

Please calculate the distance of the shortest path from E to Q.
Enter the total distance between the given nodes.

939 ✔

939

Please select the shortest path from D to P.
Please use "-" between different nodes in your shortest path. For example if your shortest path is ABC, then enter A-B-C as your answer. Include the starting and the ending node in your answer.

D-I-N-M-L-Q-P ✔

Please calculate the distance of the shortest path from D to P.
Enter the total distance between the given nodes.

948 ✔

948

Submit You have used 1 of 2 attempts

✔ Correct (15/15 points)

Question 2.

10/10 points (graded)
Your syrup has arrived at the DC! You have repackaged the syrup for sales to the retailers in the city.

Your company currently uses vans for delivery but you are intrigued by the recent hype on autonomous ground delivery robots, and you want to compare the average daily transportation cost of using vans versus autonomous ground delivery robots.

On average, there are 354 deliveries to be delivered everyday. Each delivery requires the vehicle to make a stop. The city is estimated to be essentially a rectangle of length 20 and width 10 miles. Your DC is in the middle of the southern edge of the city.

The capacity of each van is 60 deliveries. The cost to load each van is $3. The cost to make a delivery stop is $2 per stop. The cost to unload a delivery from a van is $0.5. The cost for driving the local vans is $2.15 per mile.

What is the total linehaul distance of all van tours? Assume a linehaul circuity factor of 1.06. Please use the continuous function to estimate the number of linehaul tours, and do not round it up or down.
Round your answer to two decimal figures.

95.94 ✔

95.94

What is the traveling salesman distance covered by all van tours? Assume a traveling salesman circuity factor of 1.10.
Round your answer to two decimal figures.

292.69 ✔

292.69

What is the total transportation cost per delivery? Make sure you include all costs from leaving the DC to delivery at the destination.
Round your answer to two decimal figures.

4.87 ✔

4.87

Submit You have used 2 of 2 attempts

✔ Correct (10/10 points)

Question 3.

10/10 points (graded)
In Question 2. you calculated the total transportation cost per delivery when using vans. In Question 3. we will calculate the costs when using autonomous ground delivery robots.

RoboCab, the company providing the robots gave you a list of descriptions and projected costs. The capacity of each robot is 5 deliveries. The cost to load each robot is $4. The cost to make a delivery stop is $1. The cost to unload a delivery is $1. The cost for moving the robots is $1.62 per mile.

What is the total linehaul distance of all robot tours? Assume a linehaul circuity factor of 1.06. Please use the continuous function to estimate the number of linehaul tours, and do not round it up or down.

1068.83432617 ✔

1068.83432617

What is the traveling salesman distance of all robot tours? Since the ground delivery robots are small, they can use pedestrain walkways and take short cuts in the city. Assume a lower traveling salesman circuity factor of 1.06.

282.047655548 ✔

282.047655548

What is the total transportation cost per delivery? Make sure you include all costs from leaving the DC to delivery at the destination.

8.95335133541 ✔

8.95335133541

Submit You have used 1 of 2 attempts

✔ Correct (10/10 points)