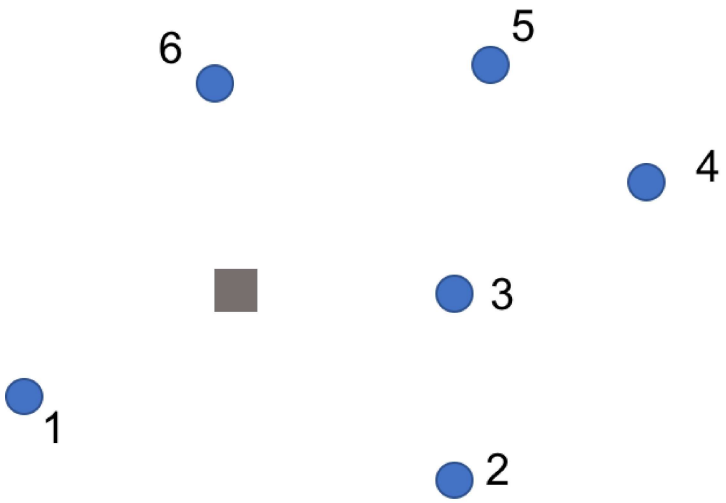
PP2 - Local routing

You are routing your vehicles to deliver goods to six customers. Your DC is located where the grey box is and the customers are located where the blue circles are. The customers are identified with an ID.



These are the distances between the customer locations and the distribution centers in miles.

Distance (miles)	1	2	3	4	5	6	DC
1		16	16.2	20	18.7	17.9	12.1
2			6.5	14.9	15.8	16.4	10.6
3				7.9	9.8	10.4	9.4
4					6.4	13.4	17.2
5						12.1	15.4
6							16.7

These are number of boxes of goods the customers need.

Customer ID	1	2	3	4	5	6
Demand (Boxes)	32	18	25	19	42	13

Savings calculation

0 points possible (ungraded)
We first start by calculating the distance savings when we pair customers into a tour loop.

What is the distance saving to travel from the DC to customer 1 and 6 and back to the DC versus delivering directly to each of them from the DC and back?

10.9 ✔

10.9

What is the distance saving to travel from the DC to customer 2 and 4 and back to the DC versus delivering directly to each of them from the DC and back?

12.9 ✔

12.9

Submit You have used 3 of 3 attempts

Ranking savings

0 points possible (ungraded)
Next, we rank the distance savings.

What is the greatest savings you can get from pairing two customers in one tour? (Do not consider vehicle capacity for now)

34.4 ✖

34.4

What is the smallest savings you can get from pairing two customers in one tour?

5.3 ✔

5.3

Submit You have used 3 of 3 attempts

Vehicle routes

0 points possible (ungraded)

Consider that each van can only carry 50 boxes per tour.

How many vans do you need?

4 ✔ **Answer:** 4

4

Please describe the tour including customer 1.

Write the sequence of customer ID starting with the smaller ID, with a dash and without space in between, e.g., if the tour serves customers 24, 26 and 22, write 22-26-24, if the tour serves only customer 17, write 17.

1 ✔ **Answer:** 1 **or** 1

Please describe the tour including customer 2.

Write the sequence of customer ID starting with the smaller ID, with a dash and without space in between, e.g., if the tour serves customers 24, 26 and 22, write 22-26-24, if the tour serves only customer 17, write 17.

2-3 ✔ **Answer:** 2-3 **or** 2 - 3

Please describe the tour including customer 3.

Write the sequence of customer ID starting with the smaller ID, with a dash and without space in between, e.g., if the tour serves customers 24, 26 and 22, write 22-26-24, if the tour serves only customer 17, write 17.

2-3 ✔ **Answer:** 2-3 **or** 2 - 3

Please describe the tour including customer 4.
Write the sequence of customer ID starting with the smaller ID, with a dash and without space in between, e.g., if the tour serves customers 24, 26 and 22, write 22-26-24, if the tour serves only customer 17, write 17.

4-6 ✔ **Answer:** 4-6 **or** 4 - 6

Please describe the tour including customer 5.
Write the sequence of customer ID starting with the smaller ID, with a dash and without space in between, e.g., if the tour serves customers 24, 26 and 22, write 22-26-24, if the tour serves only customer 17, write 17.

5 ✔ **Answer:** 5 **or** 5

Please describe the tour including customer 6.
Write the sequence of customer ID starting with the smaller ID, with a dash and without space in between, e.g., if the tour serves customers 24, 26 and 22, write 22-26-24, if the tour serves only customer 17, write 17.

4-6 ✔ **Answer:** 4-6 **or** 4 - 6

Explanation
We look down the rank of savings to identify customers that can be paired. We only pair the customers in a loop if the sum of the demand do not exceed 50. We cannot pair customers 4 and 5 because their demand will sum up to 61 boxes, but we can pair customers 4 and 6. Similarly, we can only pair customers 2 and 3. Cutomers 1 and 5 cannot be paired with each other nor be added to the existing loops within exceeding the vans' capacity.

Submit You have used 1 of 3 attempts

ℹ Answers are displayed within the problem

Questions, comments and suggestions about this section

If you have any questions, comments or suggestions about this section, please use the "Add a Post" button in the discussion forum below. Your post will be indexed in the right category and it will be easier for the staff to answer it!

If you have a question, classify your post as a "question" (instead of "discussion"), since we try to review those post first.

Discussion

Hide Discussion

Topic: Week 4 / PP2 - Local routing

Add a Post

Show all posts ▼ by recent activity ▼

? Another possible solution? 3

I found another route with the cost of 92.5 which less than the one in the answer. Where is the trouble?

VRP with MILP 1