Time left 0:19:08

Question 2

Not yet answered

Marked out of 1.00

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As a logistics engineer working for a food production factory, your job entails building vehicle routes that trucks should follow to fulfill retailers' demands. All trucks are located at your company-operated distribution center (DC) to start routing towards assigned customers and then return to the same DC. On a given day, the company must serve eight customers (A, B, C, D, E, F, G, H). Each customer requests a given number of the product units from the DC, as shown below. The trucks you may use to deliver the goods have equal capacities with 65 units each. The minimum distance path between all customers' locations and between DC and all customers' sites is summarized in the last table.

Use the Clarke-wright savings heuristic to generate a set of routes. Record the savings you implement at each iteration. Draw the tours on a copy of the graph provided, report the distances for each tour, total distances traveled by all vehicles, and how many units each vehicle will deliver.

Table 2 Customers demands

Customer	A	B	C	D	E	F	G	H
Demand	16	20	14	29	22	15	28	36

Table 3 Distances between all pairs

From \ To	DC	A	B	C	D	E	F	G	H
DC	0	25	16	21	7	24	16	24	28
A		0	14	22	26	34	40	38	53
B			0	24	13	21	27	35	44
C				0	26	41	33	15	39
D					0	17	15	31	32
E						0	25	49	44
F							0	32	20
G								0	30
H									0

B

Finish attempt ...

A tourism company needs to transport 14 groups of tourists in group sizes, as shown in the table below. The company uses a homogeneous fleet of buses departing from the same location (Company) with a capacity of 20 for each bus. The company needs to use the minimum possible number of buses to minimize cost. Groups cannot be split; they must stay together.

Table 1 Groups' sizes

Group	Size (number of persons)
A	14
B	10
C	9
D	7
E	8
F	11
G	7
H	13
I	6
J	11
K	4
L	7
M	6
N	6

- Use the (online Next Fit, First Fit, Best Fit) bin packing heuristics to assign each

H	13
I	6
J	11
K	4
L	7
M	6
N	6

A. Use the (online Next Fit, First Fit, Best Fit) bin packing heuristics to assign each group to one of the buses. How many empty seats left (the sum of all unused seats resulted from each heuristic)?

B. Use the (offline Next fit decreasing, first-fit decreasing, best fit decreasing) bin packing heuristics to assign each group to one of the buses. How many empty seats left (the sum of all unused seats resulted from each heuristic)?

C. What is the minimum possible (optimal) required number of buses?