Lab-10

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AIM: Travelling salesman problem using Nearest neighbour heuristic and greedy Edge Heuristic

→ Let us assume person starts at city one. when the person is at city one, we have to find out which is the next best place to go

Nearest Neighbour Heuristic

	1	2	3	4	5
city → 1	-	10	8	9	7
2	10	-	10	5	6
3	8	10	-	8	9
4	9	5	8	-	6
5	7	6	9	6	-

city 1 : 1 - 5 - 2 - 4 - 3 - 1

cost = 7 + 6 + 5 + 8 + 8

∴ cost = 34

city 2 : 2 - 4 - 5 - 1 - 3 - 2

cost = 5 + 6 + 7 + 8 + 10

∴ cost = 36

city 3 : 3 - 1 - 5 - 2 - 4 - 3

cost = 8 + 7 + 6 + 5 + 8

∴ cost = 34

city 4 : 4-2-5-1-3-4

cost = 5+6+7+8+8

∴ cost = 34

city 5 : 5-2-4-3-1-5

cost = 6+5+8+8+7

∴ cost = 34

Greedy Edge Heuristic

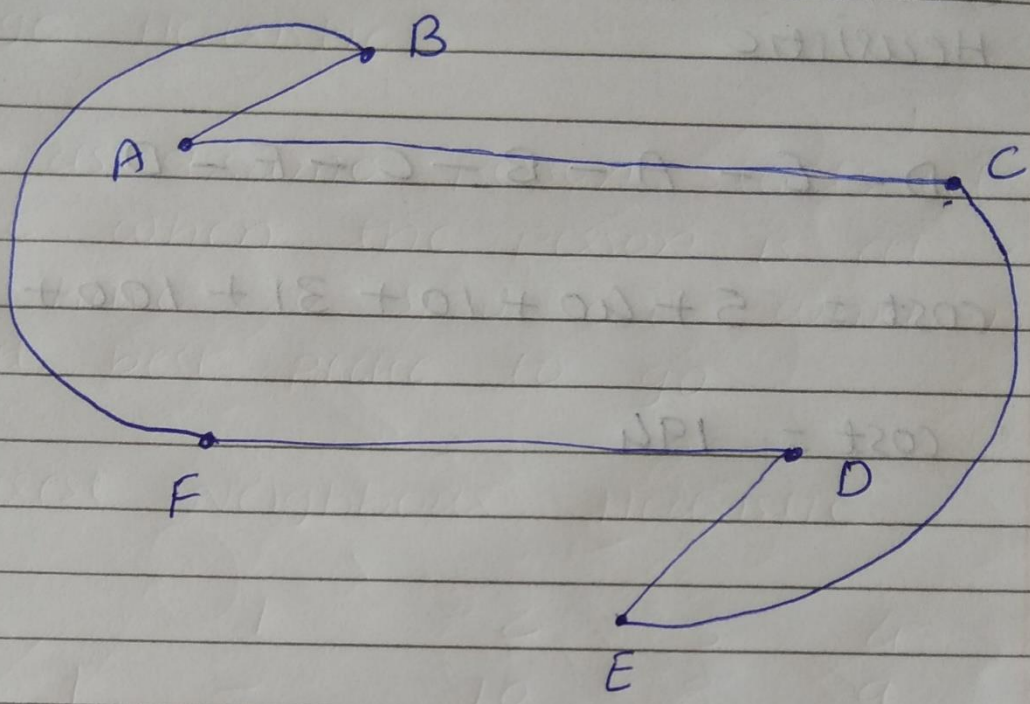
	A	B	C	D	E	F
A	0	10	20	30	40	50
B	10	0	31	21	51	41
C	20	31	0	12	59	100
D	30	21	12	0	5	8
E	40	51	59	5	0	69
F	50	41	100	8	69	0

Rules:

select / Add edges

- Incremental order of cost
- Degree should not be more than two
- cycle not allowed, except starting city

Let's start with DE



5, DE	✓
8, DF	✓
10, AB	✓
12, CD	X
20, AC	✓
21, BD	X
30, AD	X
31, BC	X
40, AE	X
41, BF	X
50, AF	X
51, BE	X
59, CE	✓

D - E - C - A - B - F - D

∴ cost = 5 + 59 + 20 + 10 + 41 + 8

when applying Neasest Neighbours Heuristic

D - E - A - B - C - F - D

cost = 5 + 40 + 10 + 31 + 100 + 8

∴ cost = 194