

作业17解答:

1. 根据以下距离矩阵, 用分枝定界法, 求TSP问题的解。设按字典序考虑各边。

	a	b	c	d	e
a	0	5	7.1	16.6	15.5
b		0	5	11.7	11.1
c			0	14	14.3
d				0	3
e					0

1. 解: 分枝定界法的树如下图。各结点的 Hamilton 圈
的代价下界:

$$A: f = (5 + 7.1 + 5 + 5 + 7.1 + 5 + 3 + 11.7 + 3 + 11.1) / 2 = 31.5$$

$$B: f = (5 + 7.1 + 5 + 5 + 7.1 + 5 + 3 + 11.7 + 3 + 11.1) / 2 = 31.5$$

$$C: f = (7.1 + 15.5 + 5 + 11.1 + 7.1 + 5 + 3 + 11.7 + 3 + 11.1) / 2 = 39.8$$

$$D: f = (5 + 7.1 + 5 + 5 + 7.1 + 5 + 3 + 11.7 + 3 + 11.1) / 2 = 31.5$$

$$E: f = (5 + 15.5 + 5 + 5 + 5 + 14 + 3 + 11.7 + 3 + 11.1) / 2 = 39.15$$

$$F: f = (5 + 7.1 + 5 + 11.7 + 7.1 + 14.3 + 11.7 + 3 + 14.3 + 3) / 2 = 41.1$$

$$G: f = (5 + 7.1 + 5 + 11.1 + 7.1 + 14 + 3 + 14 + 3 + 11.1) / 2 = 40.2$$

$$H: f = (5 + 16.6 + 5 + 5 + 5 + 14 + 3 + 16.6 + 3 + 11.1) / 2 = 42.15$$

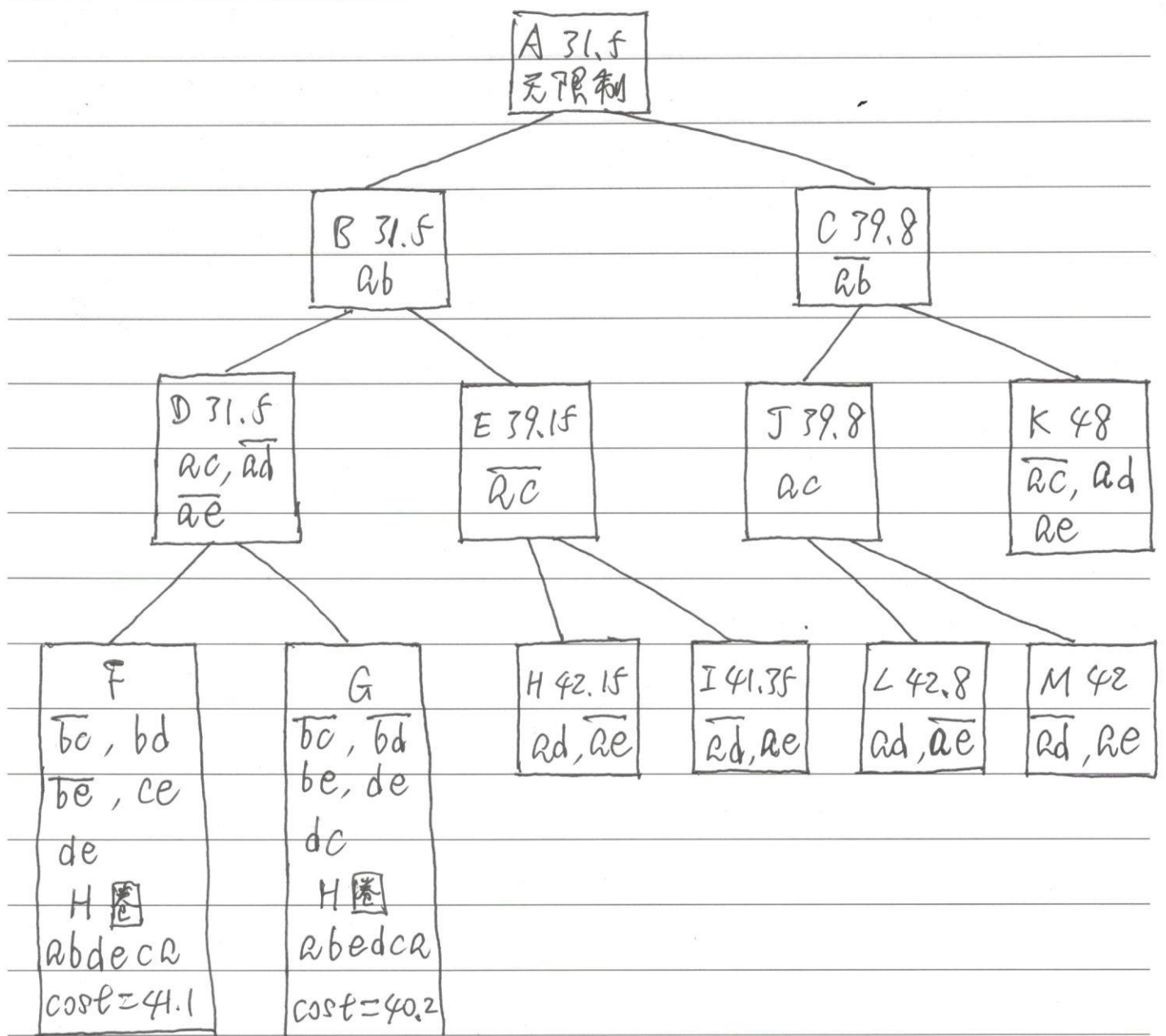
$$I: f = (5 + 15.5 + 5 + 5 + 5 + 14 + 3 + 11.7 + 15.5 + 3) / 2 = 41.35$$

$$J: f = (7.1 + 15.5 + 5 + 11.1 + 7.1 + 5 + 3 + 11.7 + 3 + 11.1) / 2 = 39.8$$

$$K: f = (16.6 + 15.5 + 5 + 11.1 + 5 + 14 + 3 + 11.7 + 11.1 + 3) / 2 = 48$$

$$L: f = (7.1 + 16.6 + 5 + 11.1 + 7.1 + 5 + 3 + 16.6 + 3 + 11.1) / 2 = 42.8$$

$$M: f = (7.1 + 15.5 + 5 + 11.1 + 7.1 + 5 + 3 + 11.7 + 3 + 15.5) / 2 = 42$$



故最优 Hamilton 为 $C = abedca$, 代价为 40.2。