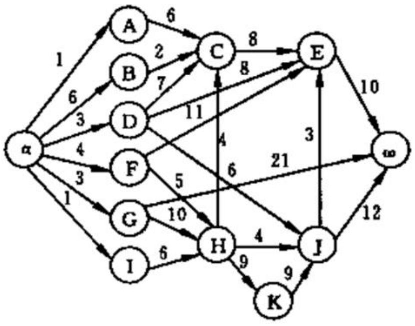
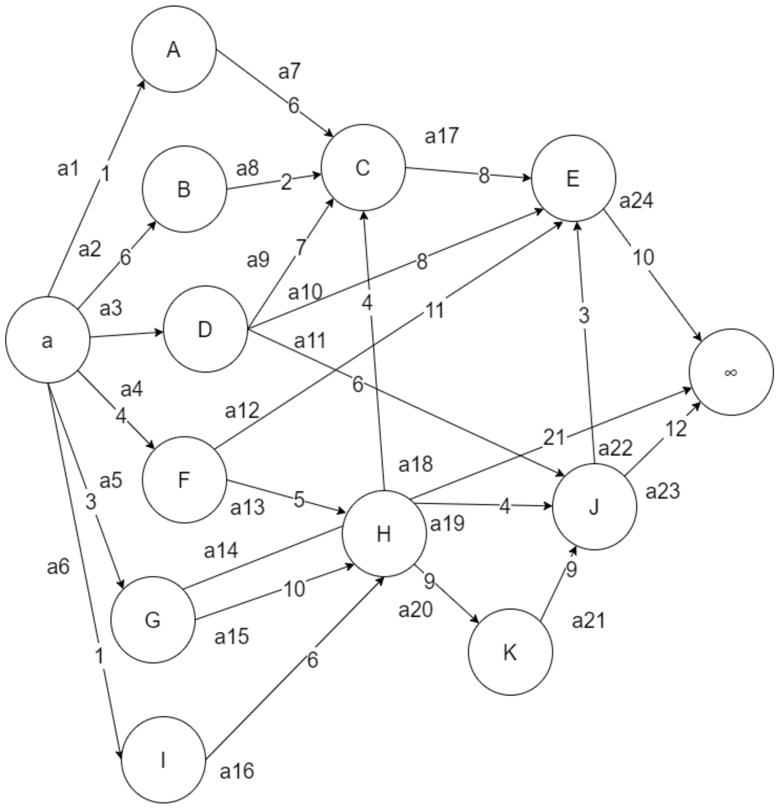
1、针对下图 AOE 网络，计算个活动弧的 e（ai），l（ai）的值、各事件（顶点）的 ve（vi），l（vi）。



解：右图为各边的编号以及边和点的信息。



Ve(vi)：

Ve(A) = 1
Ve(B) = 6
Ve(C) = 17(a→G→H→C)
Ve(D) = 3
Ve(E) = 25(a→G→H→C→E)
Ve(F) = 4
Ve(G) = 3
Ve(H) = 13(a→G→H)
Ve(I) = 1
Ve(J) = 31(a→G→H→K→J)
Ve(K) = 22(a→G→H→K)
Ve(∞) = 43

I(vi)：

I(A) = 19
I(B) = 23
I(C) = 25
I(D) = 18
I(E) = 33
I(F) = 8
I(G) = 3
I(H) = 13
I(I) = 7
I(J) = 31
I(K) = 22
I(∞) = 43

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e(ai)

e(a1) = 0	e(a7) = 1	e(a13) = 4	e(a19) = 13
e(a2) = 0	e(a8) = 6	e(a14) = 3	e(a20) = 13
e(a3) = 0	e(a9) = 3	e(a15) = 3	e(a21) = 22
e(a4) = 0	e(a10) = 3	e(a16) = 1	e(a22) = 31
e(a5) = 0	e(a11) = 3	e(a17) = 17	e(a23) = 31
e(a6) = 0	e(a12) = 4	e(a18) = 13	e(a24) = 25

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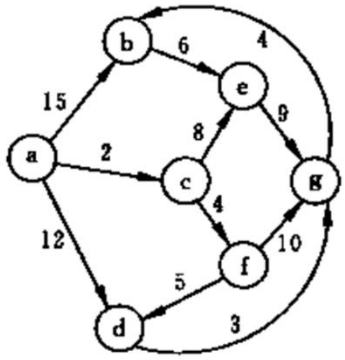
l(ai)

l(a1) = 18	l(a7) = 19	l(a13) = 8	l(a19) = 27
l(a2) = 17	l(a8) = 22	l(a14) = 22	l(a20) = 13
l(a3) = 15	l(a9) = 18	l(a15) = 3	l(a21) = 22
l(a4) = 4	l(a10) = 25	l(a16) = 7	l(a22) =30
l(a5) = 0	l(a11) = 25	l(a17) = 25	l(a23) = 31
l(a6) = 6	l(a12) = 27	l(a18) = 21	l(a24) = 33

2.利用 Dijkstra 算法，求图中顶点 a 到其他各顶点的最短路径，写出执行算法过程中各步的状态



解：

步骤一：以 a 为起点初始待定路径表

STEP1

生长点	b	c	d	e	f	g
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = ad D(d) = 12	P(e) = null D(e) = ∞	P(f) = null D(f) = ∞	P(g) = null D(g) = ∞

步骤二：从待定路径表中选出一条最短的边，设其顶点为新的生长点，并且对剩下每一个生长点进行比较，若以新生长点为中转的路径短于原始路径则替换。

STEP2

生长点	b	c	d	e	f	g
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = ad D(d) = 12	P(e) = null D(e) = ∞	P(f) = null D(f) = ∞	P(g) = null D(g) = ∞
c	P(b) = ab D(b) = 15		P(d) = ad D(d) = 12	P(e) = ace D(e) = 10	P(f) = acf D(f) = 6	P(g) = null D(g) = ∞

对步骤二进行 n-2 次重复（注：绿色表示当前有新的通路，但路径长度大于原来的路径故步替换，红色为新的通路的路径长度小于原来路径的长度故替换）

STEP3

生长点	b	c	d	e	f	g
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = ad D(d) = 12	P(e) = null D(e) = ∞	P(f) = null D(f) = ∞	P(g) = null D(g) = ∞
c	P(b) = ab D(b) = 15		P(d) = ad D(d) = 12	P(e) = ace D(e) = 10	P(f) = acf D(f) = 6	P(g) = null D(g) = ∞
f	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11	P(e) = ace D(e) = 10		P(g) = acfg D(g) = 16

STEP4

生长点	b	c	d	e	f	g
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = ad D(d) = 12	P(e) = null D(e) = ∞	P(f) = null D(f) = ∞	P(g) = null D(g) = ∞
c	P(b) = ab D(b) = 15		P(d) = ad D(d) = 12	P(e) = ace D(e) = 10	P(f) = acf D(f) = 6	P(g) = null D(g) = ∞
f	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11	P(e) = ace D(e) = 10		P(g) = acfg D(g) = 16
e	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11			P(g) = acfg D(g) = 16

STEP5

生长点	b	c	d	e	f	g
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = ad D(d) = 12	P(e) = null D(e) = ∞	P(f) = null D(f) = ∞	P(g) = null D(g) = ∞
c	P(b) = ab D(b) = 15		P(d) = ad D(d) = 12	P(e) = ace D(e) = 10	P(f) = acf D(f) = 6	P(g) = null D(g) = ∞
f	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11	P(e) = ace D(e) = 10		P(g) = acfg D(g) = 16
e	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11			P(g) = acfg D(g) = 16
d	P(b) = ab D(b) = 15					P(g) = acfdg D(g) = 14

STEP6

生长点	b	c	d	e	f	g
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = ad D(d) = 12	P(e) = null D(e) = ∞	P(f) = null D(f) = ∞	P(g) = null D(g) = ∞
c	P(b) = ab D(b) = 15		P(d) = ad D(d) = 12	P(e) = ace D(e) = 10	P(f) = acf D(f) = 6	P(g) = null D(g) = ∞
f	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11	P(e) = ace D(e) = 10		P(g) = acfg D(g) = 16
e	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11			P(g) = acfg D(g) = 16
d	P(b) = ab D(b) = 15					P(g) = acfdg D(g) = 14
g	P(b) = ab D(b) = 15					

STEP7

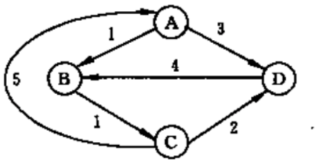
生长点	b	c	d	e	f	g
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = ad D(d) = 12	P(e) = null D(e) = ∞	P(f) = null D(f) = ∞	P(g) = null D(g) = ∞
c	P(b) = ab D(b) = 15		P(d) = ad D(d) = 12	P(e) = ace D(e) = 10	P(f) = acf D(f) = 6	P(g) = null D(g) = ∞
f	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11	P(e) = ace D(e) = 10		P(g) = acfg D(g) = 16
e	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11			P(g) = acfg D(g) = 16
d	P(b) = ab D(b) = 15					P(g) = acfdg D(g) = 14
g	P(b) = ab D(b) = 15					
b				P(e) = ace D(e) = 10		

STEP8

生长点	b	c	d	e	f	g
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = ad D(d) = 12	P(e) = null D(e) = ∞	P(f) = null D(f) = ∞	P(g) = null D(g) = ∞
c	P(b) = ab D(b) = 15		P(d) = ad D(d) = 12	P(e) = ace D(e) = 10	P(f) = acf D(f) = 6	P(g) = null D(g) = ∞
f	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11	P(e) = ace D(e) = 10		P(g) = acfg D(g) = 16
e	P(b) = ab D(b) = 15		P(d) = acfd D(d) = 11			P(g) = acfg D(g) = 16
d	P(b) = ab D(b) = 15					P(g) = acfdg D(g) = 14
g	P(b) = ab D(b) = 15					
b				P(e) = ace D(e) = 10		
a	P(b) = ab D(b) = 15	P(c) = ac D(c) = 2	P(d) = acfd D(d) = 11	P(e) = ace D(e) = 10	P(f) = acf D(f) = 6	P(g) = acfdg D(g) = 14

3.利用 Floyd 算法，求图中各对顶点间的最短路径

解：



STEP1:初始邻接矩阵 D，和 Path

	A	B	C	D
A	0	1	∞	3
B	∞	0	1	∞
C	5	∞	0	2
D	∞	4	∞	0

	A	B	C	D
A	-1	-1	-1	-1
B	-1	-1	-1	-1
C	-1	-1	-1	-1
D	-1	-1	-1	-1

STEP2:以 A 为中转点，进行第一次迭代

	A	B	C	D
A	0	1	∞	3
B	∞	0	1	∞
C	5	6	0	2
D	∞	4	∞	0

	A	B	C	D
A	-1	-1	-1	-1
B	-1	-1	-1	-1
C	-1	A	-1	-1
D	-1	-1	-1	-1

STEP3:以 B 为中转点，进行第二次迭代

	A	B	C	D
A	0	1	2	3
B	∞	0	1	∞
C	5	6	0	2
D	∞	4	5	0

	A	B	C	D
A	-1	-1	-1	-1
B	-1	-1	-1	-1
C	-1	A	-1	-1
D	-1	-1	B	-1

STEP4:以 C 为中转点，进行第三次迭代

	A	B	C	D
A	0	1	2	3
B	6	0	1	3
C	5	6	0	2
D	10	4	5	0

	A	B	C	D
A	-1	-1	-1	-1
B	C	-1	-1	C
C	-1	A	-1	-1
D	C	-1	B	-1

STEP5:以 D 为中转点，进行第四次迭代

	A	B	C	D
A	0	1	2	3
B	6	0	1	3
C	5	6	0	2
D	10	4	5	0

	A	B	C	D
A	-1	-1	-1	-1
B	C	-1	-1	C
C	-1	A	-1	-1
D	C	-1	B	-1

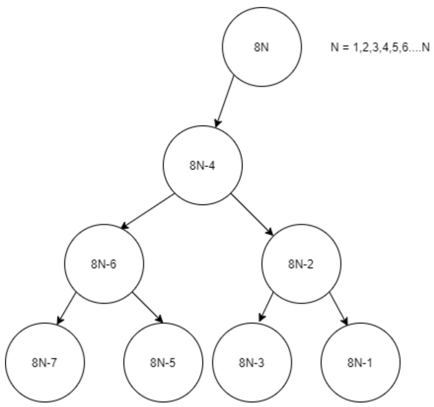
STEP6:得出最终的 D，和 Path 矩阵

	A	B	C	D
A	0	1	2	3
B	6	0	1	3
C	5	6	0	2
D	10	4	5	0

	A	B	C	D
A	-1	-1	-1	-1
B	C	-1	-1	C
C	-1	A	-1	-1
D	C	-1	B	-1

4. 已知一个有序表的表长为 8N，并且表中没有关键字相同的记录。假设按如下所述方法查找一个关键字等于给定值 K 的记录：先在第 8,16,24,…,8K,…,8N 个记录中进行顺序查找，或者查找成功，或者由此确定出一个继续进行折半查找的范围。画出描述上述查找过程的判定树，并求等概率查找时查找成功的平均查找长度。

解：该查找过程的判定树如下



$$ASL = \frac{N+1}{2} + \frac{(1+2\times 2+3\times 4)}{8}$$

------------------------------------END------------------------------------