2012-11598 민두기

1-(a).

$$\cos(A,B) = \frac{20000 * \alpha + 3 * (\beta^2 + 0.3417)}{\sqrt{(6400 * \alpha^2 + \beta^2 + 0.4489) * (62500 * \alpha^2 + 9 * (\beta^2 + 0.2601))}}$$

$$\cos(B,C) = \frac{25600 * \alpha + 3 * (\beta^2 + 0.326067)}{\sqrt{(6400 * \alpha^2 + \beta^2 + 0.4489) * (102400 * \alpha^2 + 9 * (\beta^2 + 0.236844))}}$$

$$\cos(A,C) = \frac{80000 * \alpha + 9 * (\beta^2 + 0.2482)}{\sqrt{(62500 * \alpha^2 + 9 * (\beta^2 + 0.2601)) * (102400 * \alpha^2 + 9 * (\beta^2 + 0.236844))}}$$

angle(A,B) = acos(cos(A,B))
angle(B,C) = acos(cos(B,C))
angle(A,C) = acos(cos(A,C))

1-(b).

$$\alpha = 1, \beta = 1$$

angle(A,B) = 0.0023094 rad
angle(B,C) = 0.0049288 rad
angle(A,C) = 0.0030518 rad

1-(c).

$$\alpha = 0.01, \beta = 0.5$$

angle(A,B) = 0.13515 rad
angle(B,C) = 0.24892 rad
angle(A,C) = 0.13006 rad

1-(d)

$$\alpha = \frac{Avg(Processor\ Speed)}{Avg(Disk\ Size)} = \ 0.0059315$$

$$\beta = \frac{Avg(Processor\ Speed)}{Avg(Main - Memory\ Size)} = \ 0.54125$$

angle(A,B) = 0.14256 rad
angle(B,C) = 0.24851 rad
angle(A,C) = 0.13027 rad

2-(a).

Avg(star) = 3.667
Star(A) = 0.33333
Star(B) = -1.6667
Star(C) = 1.3333

2-(b)
user = 0.3333*A − 1.6667*B + 1.3333*C = [0.44667, 486.67, 3.3333]

3-(a)
sim(A,B) = 0.5
sim(B,C) = 0.5
sim(C,A) = 0.5

3-(b)
cos(A,B) = 0.667
cos(B,C) = 0.667
cos(C,A) = 0.667

3-(c)
sim(A,B) = 0.625
sim(B,C) = 0.375
sim(C,A) = 0.5

3-(d)
cos(A,B) = 0.577
cos(B,C) = 0.289
cos(C,A) = 0.5

3-(e)

	a	b	c	d	e	f	g	h
A	0.667	1.667		1.667	-2.333		-0.333	-1.333
B		0.667	1.667	0.667	-1.333	-0.333	-1.333	
C	-1		-2	0		1	2	0

3-(f)

cos(A,B) = 0.58431
cos(B,C) = -0.73957
cos(A,C) = -0.11547

4-(a)
There are many cluster. I choose one.

(1, 0, 0),
(1, 1, 0),
(0, 1, 0),
(1, 1, 1),
(0, 0, 0),
(0, 0, 1),
(1, 0, 1),
(0, 0, 1),

(1, 0, 0),
(1, 1, 0),
(0, 1, 0),
(1, 1, 1),
(0, 0, 0),
(0, 0, 1), (0, 0, 1),
(1, 0, 1),

(1, 0, 0), (1, 1, 0),
(0, 1, 0),
(1, 1, 1),
(0, 0, 0),
(0, 0, 1), (0, 0, 1),
(1, 0, 1),

(1, 0, 0), (1, 1, 0), (0, 1, 0),
(1, 1, 1),
(0, 0, 0),
(0, 0, 1), (0, 0, 1),
(1, 0, 1),

(1, 0, 0), (1, 1, 0), (0, 1, 0), (1, 1, 1),
(0, 0, 0),
(0, 0, 1), (0, 0, 1),
(1, 0, 1),

Cluster1 = a,b,c,d
Cluster2 = e
Cluster3 = f,h
Cluster4 = g

4-(b)

	Cluster1	Cluster2	Cluster3	Cluster4
A	4.667	1	2	3
B	3.333	1	2	1
C	2	0	3.5	5

4-(c)
cos(A,B) = 0.95202
cos(B,C) = 0.70261
cos(A,C) = 0.81562