**Quiz 8 Solutions**

1. a) rank(A)=2. Only two of the rows are linearly independent from each other.

b) Since rank(A)=2, in order to have a matrix with rank 1, rank(B)=1. Any 3\*3 matrix with rank 1 is correct, for example:

1. a) 100 \* 20

b) rank(AB)<= min(rank(A), rank(B))=5

1. a)

b) x and y are highly correlated, a good guess could be 0.95 or 0.9

c) One of the dimensions is almost twice the other, so an approximation could be:

u = , v =

1. Plot:
2. Dendrogram:

(5,5)

(1,5)

(1,1)

(4,1)

(3,1)

Or:

(5,5)

(1,5)

(1,1)

(4,1)

(3,1)

1. Dendrogram:

(5,5)

(1,5)

(1,1)

(4,1)

(3,1)

1. A good guess could be (1,1), (3,1), (4,1) and (1,5), (5,5). Start from (1,1) and (1,5) as the initial centroids, (3,1) and (4,1) will be grouped to (1,1) and (5,5) will be grouped to (1,5); new centroids will be computed, then the algorithm stops.