Information Retrieval and Text Mining Fall 2016

Quiz 4 (Total Marks = 10)

Roll No: **Name**

Q1) Consider following posting list of a term. (document Id, count, [positions])

(3,3,[4,7,12]) (5,1,[84]) (12,4,[13,15,20,24])

a) Delta encode document Ids and delta encode term positions
b) Encode resulting list from part a using Elias Gamma Encoding
c) How many bits are required for encoding in part b? How many bits will be required for encoding list from part a using fixed length encoding of 8 bits per number

Solution:

a) (3,3,[4,3,5]) (2,1,[84]) (7,4,[13,2,5,4])

b) 101 101 11000 101 11001 100 0 1111110010100 11011 11000 1110101 100 11001 11000

c) 3 + 3+ 5+ 3+5+3 +1+ 13+ 5+5+7+3+5+5 = 5*6 + 3*5 + 1+13+7 = 30+15+21 = 66

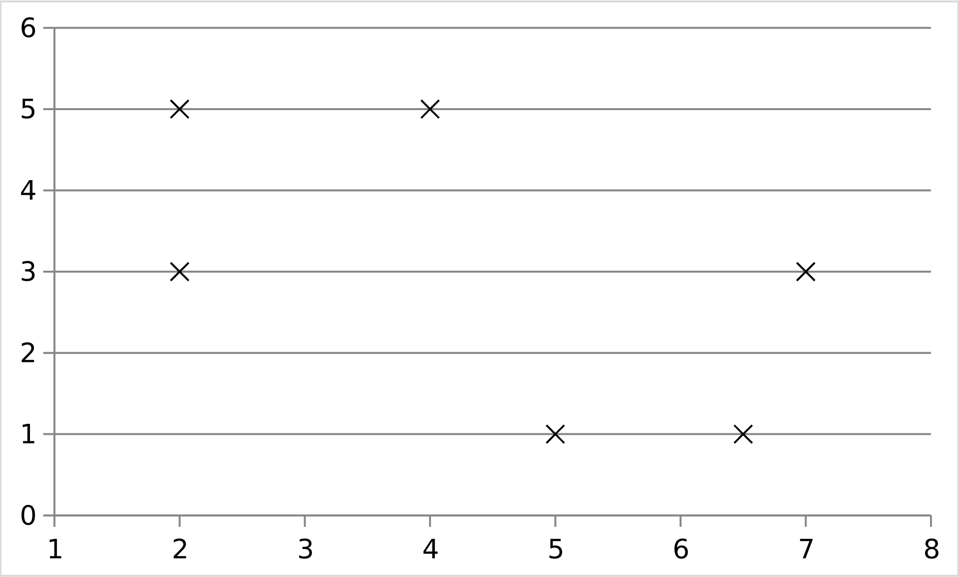
encoding list from part a using fixed length encoding = 14*8 = 112

Q2) Following table gives RSS (Residual Sum of Squares) for different value of K using K Means clustering algorithm for some n documents. Which value of K will you choose and why?

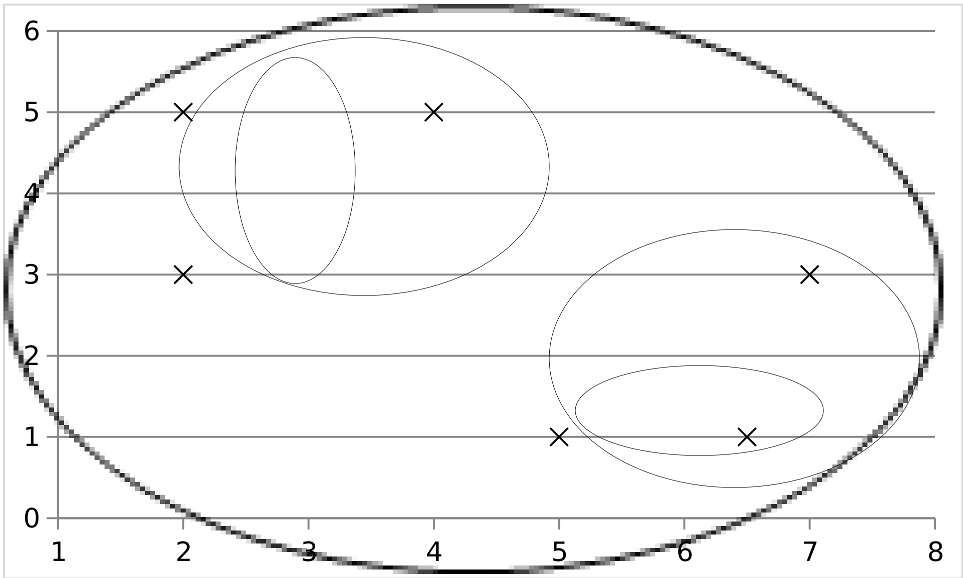
K	2	3	4	5	6	7	8	9	10
RSS	2000	1800	1610	1565	1300	1120	900	700	500

Ans: K = 4 since K = 5 doses not give much reduction in RSS . This is Knee in plot.

Q3) Create clusters using HAC (centroid clustering). Use Euclidean distance.



Solution



d1 (2,3)

d2(2,5)

d3(4,5)

d4(5,1)

d5(6.5,1)

d6(7,3)

	d1 (2,3)	d2(2,5)	d3(4,5)	d4(5,1)	d5(6.5,1)	d6(7,3)
d1 (2,3)	0					
d2(2,5)	2	0				
d3(4,5)	Sqrt(8)	2	0			
d4(5,1)	Sqrt(13)	5	17	0		
d5(6.5,1)	Sqrt(24.25)	Sqrt(36.25)	Sqrt(22.25)	1.5	0	
d6(7,3)	5	Sqrt(29)	Sqrt(13)	Sqrt(8)	Sqrt(4.25)	0

d4(5,1) and d5(6.5,1) have minimum distance so they will be merged in first iteration. Their centroid is d4-5(5.75,1)

	d1 (2,3)	d2(2,5)	d3(4,5)	d4-5(5.75,1)	d6(7,3)
d1 (2,3)	0				
d2(2,5)	2	0			
d3(4,5)	Sqrt(8)	2	0		
d4-5(5.75,1)				0	
d6(7,3)	5	Sqrt(29)	Sqrt(13)		0