	_/_/_					
	Photology 11: K. Man 11 to					
	Problem 4: K-Means Mustering					
	$i \left  \chi_{i}^{(i)} \right  \chi_{i}^{(i)} \left  k \right  k_{1}$					
	1   1   4   1   1   5					
1	$\begin{bmatrix} 2 & 1 & 3 & 2 & 1 \\ 3 & 0 & 4 & 1 & 1 \end{bmatrix}$					
	3 0 4 1 1 2 Z <sub>2</sub> ×					
Le	5 6 2 1 1 ×					
7	6 4 17 2 2					
	2 3 4 5 6 7 8					
	Calculating Centroid for Chesters (entroid for (2 (K=2)					
	(entroid for ( R3)					
-	(1+0+5+6, 4+4+1+2) $(1+4, 3+0)$					
1	(12 4) $(2.5, 1.5)$					
-						
+	(3,2.75)					
+	Salutating distance using Manhattan Method $ x_1-3 + x_2-2.75  \qquad  distance  x_1-2.5 + x_2-1.5 $					
1	$\frac{ \chi_1 - 3  +  \chi_2 - 2.75 }{ 1 - 3  +  4 - 2.75 } = 2 + 1.25 = 3.25$ $ \chi_1 - 3  +  4 - 2.75  = 2 + 1.25 = 3.25$ $ \chi_1 - 3  +  4 - 2.5  = 4$					
_						
_						
_						
	$ 5-3 + 1-2\cdot75 =3\cdot75$ > $ 5-2\cdot5 + 1-1\cdot5 =3$					
	16-31+12-2.75 < 16-2.5 +12-1.5 =4					
	14-31+10-2.75 = 3.75 > 14-2.5   + 10-1.5   = 3					
Assigning datapoints, band on the distance, to the cluster (KI)						

Centroids:  (1+10+6, 4+3+4+2) (certroids: (5+4, 1+0) (cutail (2, 3, 25).  (cutail (4, 5, 0.5)  Actigning electrodatapts to cluster backon new controids (x(-2) 4+2-325)    x(-4) 2+32-325    x(-4) 2+32-325    x(-4) 2+32-325    x(-4) 2+32-325    x(-4) 2+325    x(-					
Centroid for (1+1+0+1), (1+2+4+2)  Centroid for (1+1+0+1), (1+2+4+2)  Cluster (1+1+0+1), (1+2+4+2)  Cluster (1+1+0+1), (1+2+4+2)  Cluster (1+1+0+1), (1+2+4+2)  Cluster (1+1+0)  (1-1+1+1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1					H-
Cluster 9 4 5 4 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1					
Cluster 9 4 5 4 1 20 Cluster 12 2 2 1 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2	C. F. 11	Valuating new centroid	s. band on me of	, to	0
Assigning starters datapts to clusters land on new centroide  [X1-2) +   x2-325    X1-45  +   x2-05  water datapts    [X1-45  +   x2-325    X1-45  +   x2-05  water datapts    [X1-45  +   x2-05    x4-45  +   x2-05    x4-45  +   x2-05     [D-2+  4-325  = 1.25   1-45  +   3-05  = 2.5   1    [D-2+  4-325  = 2.26      0-45  +   4-05  = 3.5   1    [D-2+  4-325  = 2.25      16-45  +   2-05  = 1.5   2    [C-2+  2-325  = 5.25      16-45  +   2-05  = 1.5   2    [C-2+  2-325  = 5.25      16-45  +   2-05  = 1.5   2    [C-2+  4-  2-325  = 5.25      16-45  +   2-05  = 1.5   2    [C-2+  4-  4-325  = 5.25      16-45  +   2-05  = 1.5   2    [C-2+  4-  4-325  = 5.25      16-45  +   2-05  = 1.5   2    [C-2+  4-  4-325  = 0.25                               [C1-  4-  4-  4-34                                 [C1-  4-  4-  4-  4-  4-  4-  4-  4-  4-  4	Chroidfor	(1+1+0+8, 4+2+4+2)	Certroidles 15+	4 1+0)	
Actigning structure datapts to clusters land on new centroids  [X1-2] +   2x-325	(updated)	( ) ?	Cluster 2	5 05	
		(2, 3.25).	(undated)	(, , ) (), ()	
		Neila: 18 11			8
		1x1-21 11 x -2.25	o clusters bandon	new centroids	att dut
11-21+ 3-325 =1.25		11-21+14-2251-125	X1-4:51 +	122-0.5) W	ne ne
0-2  +  4-325  = 2.765		11-21+13-2.251 - 1.25	1 11-4.51714.	-0.51 = 3.5	
15-2  +   1-3·25  = 5·25   >   15-4·5  +   1-0·5  = 0·5   2     16-21 +   2-3·25  = 5·25   >   16-45  +   2-0·5  = 1·5   2     14-21 +   0-3·25  = 5·25   >   14-4·5  +   0-0·5  = 1   2	6	n-2l+ 4-3:25 =2.24			
14-21 +   0-3:25  = 5:25   >   16-45  +   2-0:5  = 1   2     14-21 +   0-3:25  = 5:25   >   14-45  +   0-0:5  = 1   2     Gentroid for C   C   = (1+1+0, 4+3+4)					
$ 14-21+ 0-3\cdot25 =5\cdot25 \qquad   >  14-45 + 0-0\cdot5 =1   2$ Centroid for (1 $C_1 = (\frac{1+1+0}{2}, \frac{4+3+4}{3}) \qquad (2 = (\frac{5+6+4}{3}, \frac{1+2+0}{3}) \qquad 3$ $= (\frac{2}{3}, \frac{11}{3}) = (0\cdot66, 3\cdot64) \qquad (2 = (5)\cdot1).$ $ x_1-0\cdot66 + x_2-3\cdot66  \qquad  x_1-5 + x_2-1  \qquad \text{updated fluites}$ $ 1-0\cdot66 + 4-3\cdot46  = 0\cdot66 \qquad  1-5 + 4-1 =7$ $ 1-0\cdot66 + 3-3\cdot66  = 0\cdot99 \qquad  1-5 + 4-1 =6$ $ 5-0\cdot66 + 4-3\cdot66  = 6\cdot99 \qquad >  5-5 + 1-1 =0 \qquad 2$ $ 6-0\cdot66 + 1-3\cdot66  = 6\cdot99 \qquad >  6-5 + 2-1 =2 \qquad 2$ $ 4-0\cdot66 + 0-3\cdot66  = 6\cdot99 \qquad >  4-5 + 0-1 =2 \qquad 2$ As the centroids 3 the cluster labels stop changing, upother upotated clusters are y-(kz)  6  The thore lustering result of ways arm regardless of initial clusters  2  C2 × Same regardless of initial clusters					2
(entroid for () $C_1 = (1+1+0), 4+3+4$ ) $= (\frac{2}{3}, \frac{11}{3}) = (0.66, 3.66)$ $ x_1 - 0.66  +  x_2 - 3.66 $ $ x_1 - 0.$					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			1 10		F
(2 - (5)   (2 - (5)   )   (2 - (5)   )		1-(1+1+0,4+3+4)	( = 15+6+4	. 1+2+0	O.
		$\frac{3}{3}$	2 2 3	3	
1-0.66  +  4-3.66  = 0.66   2   1-5  +  4-1  = 7   1   1-0.66  +  3-3.66  = 0.99.   2   1-5  +  3-1  = 6   1   10-0.66  +  4-3.66  = 0.99.   2   10-5  +  4-1  = 8   1   15-0.66  +  1-2.66  = 6.99.   15-5  +  1-1  = 0   2   16-0.66  +  1-2.66  = 6.99.   16-5  +  2-1  = 2   2   14-0.66  +  0-3.66  = 6.99.   14-5  +  0-1  = 2   2   2   2   2   2   3   3   4   4   4   4   4   4   4   4		=(3,11)=(0.66,3.66)	C2 = (5,1).		
1-0.66  + 19-3.66  = 0.99.     1-5  + 19-1  = 1   10-0.66  + 19-3.66  = 0.99.     10-5  + 19-1  = 6   1   15-0.66  + 11-3.66  = 6.99.   15-5  + 19-1  = 6   1   15-0.66  + 12-3.66  = 6.99.   16-5  + 12-1  = 2   2   14-0.66  + 10-3.66  = 6.99.   14-5  + 10-1  = 2   2   14-0.66  + 10-3.66  = 6.99.   14-5  + 10-1  = 2   2   2   3   4   4   4   4   4   4   4   4   4	l lx	1-0.661 + 1x2-3.661	1   1   2   +   2	-11 undo	ted chuter
1-0.66 + 3-2.66  =0.99.				11-7	(K3)
10 -0.66 +   4-3.66  = 0.99   <   0-5  +   4-1  = &					
15-0.66  +  11-3.66  = 6.99      5-5  +    -1  = 0   2					
16-066 +  2-3:66  = 6:99  >  6-5 +  2-1 =2   2    4-0:66 +  0-3:66  = 6:99  >  4-5 +  0-1 =2   2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  0-1 =2    4-5 +  4-5					
14-0.66 + 0-3.66  = 6.99   >  4-5 + 0-1 =2 2   ds the centroids of the cluster labels stop changing, composite expected clusters are; - (k3)   d) Final clustering does not match with initial clustering.  The elder clustering result always   same regardless of initial cluster.					2
ds the centroids of the cluster labels stop changing,  upoddes updated alusters are; - (kz)  d) Final clustering does not  match with initial clustering.  The star chustering result always  same regardless of initial cluster.					2
y and shirtening does not match with initial chustering.  The show thestering result always same regardless of initial chuster.	The state of the s		> 1 4-5 + 10-1	1=2	2
y and shirtening does not match with initial chustering.  The show thestering result always same regardless of initial chuster.	ds	the centroids & the clu	ter labels iton,	changing.	
Jind chutering does not  match with initial chutering.  The star chutering result always  same regardles of initial chuter.	u	Ade undated shutere or	e-(K2)	0 01	
The star shirtering result always same regardless of initial churter		1	~		
The star shustering result always same regardless of initial churter	6		114.11	+	-
The star shirtering result always same regardless of initial churter	5		of find ch	islesing does n	ot
2 C2 same regardles of initial chuster		* x G	- raun w	in unitial cu	ytering_
same regardus of initial chiler	3	X /	The star 1	hyterina LOL	ultalin
Auignment as shown in the R-lade.		Car		Il. and in the	1 al +
Anignment as shown in the R-lade.	2	(x)	same regar	ous of initia	x chiler
1 2 3 4 5 6 2 8	-   - I <del> </del>	/*/	Augnment	as shown in	the R-Lade.
1 1 2 3 4 5 6 2 8		<del></del>			
		1234662	Ė		