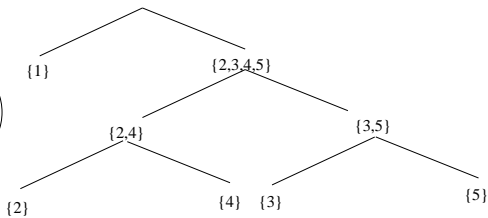
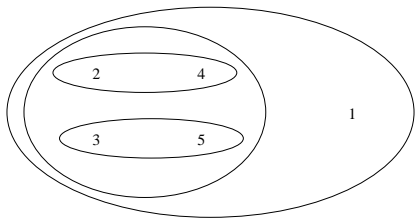
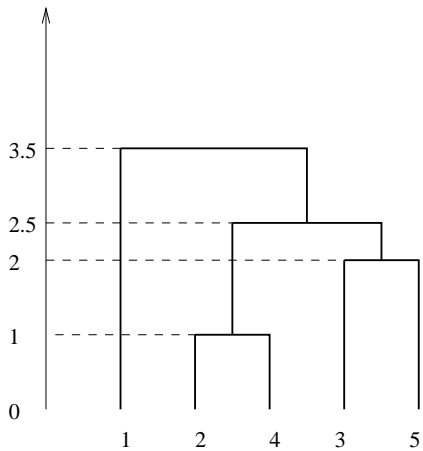




$$d(A, B) = \sqrt{(\text{nicotine}A - \text{nicotine}B)^2 + (\text{goudron}A - \text{goudron}B)^2}$$

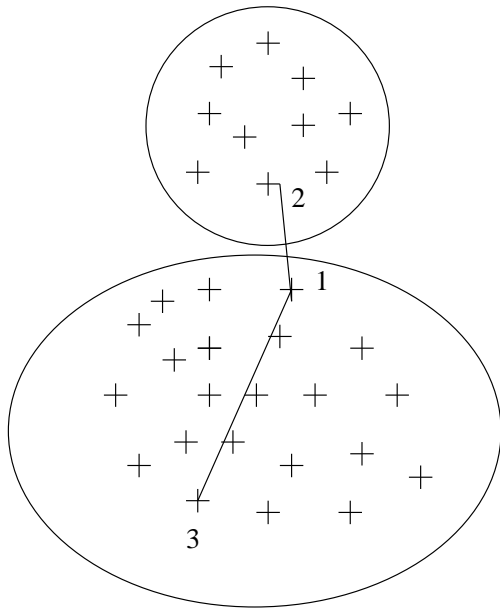
Cigarettes	Nicotine (mg)	Goudron (mg)
Royal anis	0.45	4.9
Rothmans	1.1	14
Chestereld Lights	0.6	8
Benson & Hedges	1.1	13
Peter Stuyvesant	1	12.7
Gitanes	1	12
Malboro	1	14
Lucky Strike	0.9	14





$$S(n, k) = \frac{1}{k!} \sum_{i=0}^k (-1)^{i-1} C_i^k i^n \quad S(n, k) \approx \frac{k^n}{k!} \text{ pour } n \text{ et } k \text{ grands}$$

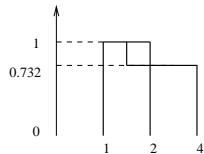
1	2	3	4	5	6	7	8
1	1						
2	1	1					
3	1	3	1				
4	1	7	6	1			
5	1	15	25	10	1		
6	1	31	90	65	45	1	
7	1	63	301	350	140	1	
8	1	127	966	1701	1050	266	8

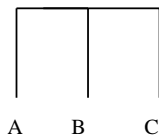
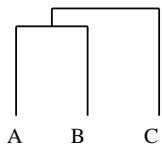


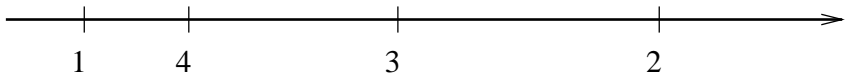
$$\begin{array}{r}
 + \\
 2 \\
 + \\
 3 \\
 \hline
 \end{array}$$

	1	2	3
1	0		
2	1	0	
3	1	1	0

	{1,2}	3
{1,2}	0	0.732



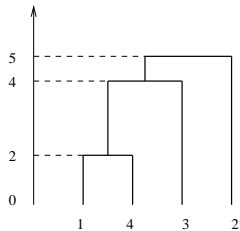


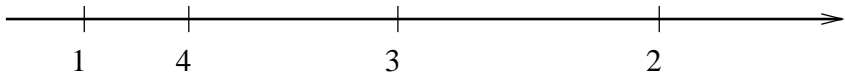


	1	2	3	4
1	0			
2	11	0		
3	6	5	0	
4	2	9	4	0

	{1,4}	2	3
{1,4}	0		
2	9	0	
3	4	5	0

	{1,4,3}	2
{1,4,3}	0	
2	5	0

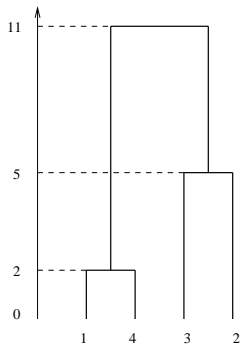


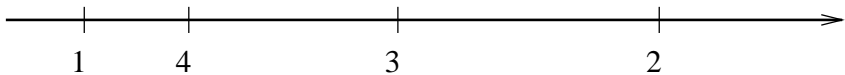


	1	2	3	4
1	0			
2	11	0		
3	6	5	0	
4	2	9	4	0

	{1,4}	2	3
{1,4}	0		
2	11	0	
3	6	5	0

	{1,4}	{2,3}
{1,4}	0	
{2,3}	11	0



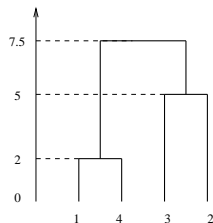
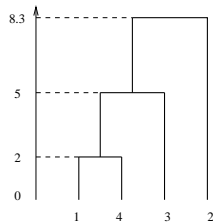


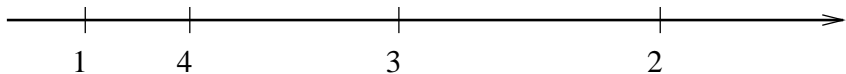
	1	2	3	4
1	0			
2	11	0		
3	6	5	0	
4	2	9	4	0

	{1,4}	2	3
{1,4}	0		
2	10	0	
3	5	5	0

	{1,4,3}	2
{1,4,3}	0	
2	8.3	0

	{1,4}	{2,3}
{1,4}	0	
{2,3}	7.5	0

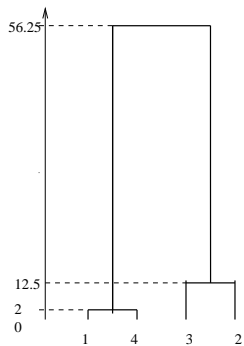


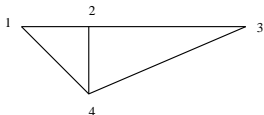


	1	2	3	4
1	0			
2	60.5	0		
3	18	12.5	0	
4	2	40.5	8	0

	{1,4}	2	3
{1,4}	0		
2	66.7	0	
3	16.7	12.5	0

	{1,4}	{2,3}
{1,4}	0	
{2,3}	56.2	0

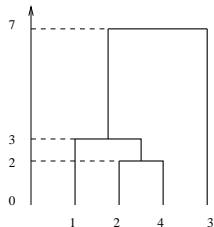




	1	2	3	4
1	0			
2	3	0		
3	10	7	0	
4	3.6	2	7.3	0

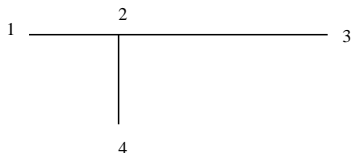
	1	{2,4}	3
1	0		
{2,4}	3	0	
3	10	7	0

	{1,2,4}	3
{1,2,4}	0	
3	3	0



Construction de  $\delta_{min}$

	1	2	3	4
1	0			
2	3	0		
3	7	7	0	
4	3	2	7	0



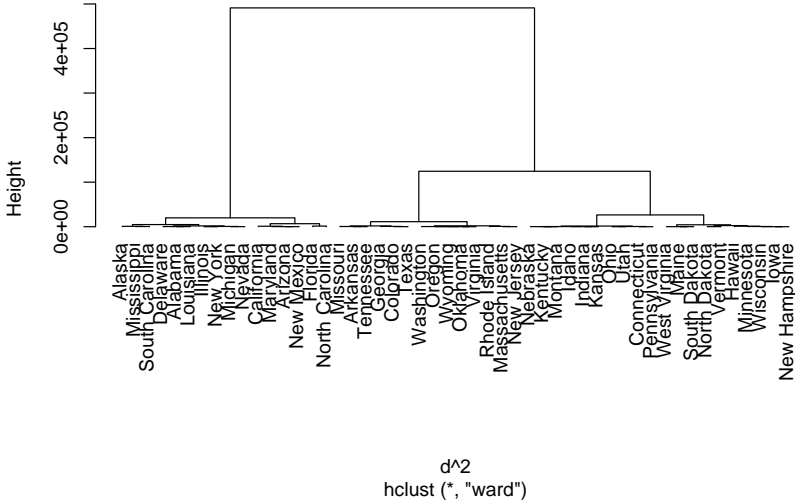
Arbre de longueur minimum

	a	b	c
a	0		
b	1	0	
c	2	1	0

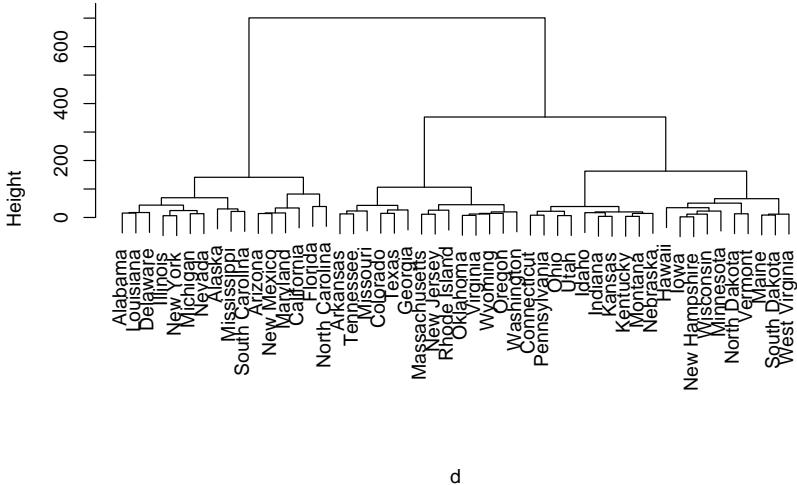
	a	b	c
a	0		
b	1	0	
c	2	2	0

	a	b	c
a	0		
b	2	0	
c	2	1	0

# Cluster Dendrogram



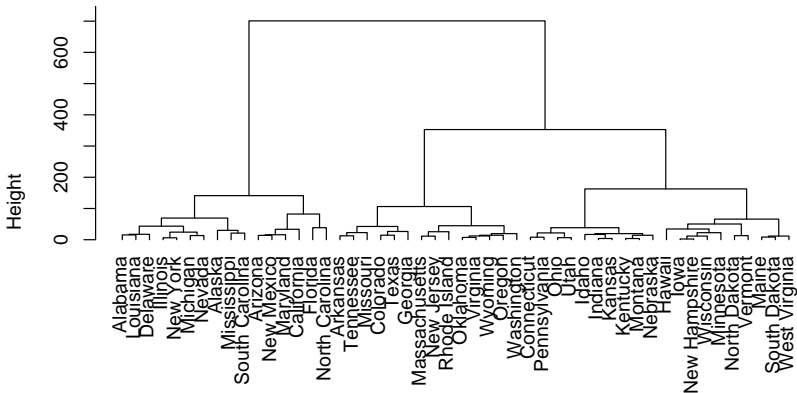
### Dendrogram of agnes(x = d, method = "ward")



Agglomerative Coefficient = 0.98



# Cluster Dendrogram



d  
agnes (\*, "ward")



