

$$\mathbf{z} = \begin{pmatrix} z_1 \\ z_2 \\ z_3 \\ z_4 \\ z_5 \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \\ 1 \\ 1 \\ 2 \end{pmatrix} \quad \text{ou} \quad \mathbf{z} = \underbrace{\begin{pmatrix} z_{11} & z_{12} \\ z_{21} & z_{22} \\ z_{31} & z_{32} \\ z_{41} & z_{52} \\ z_{51} & z_{52} \end{pmatrix}}_{\text{Matrice de clasification}} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \\ 1 & 0 \\ 1 & 0 \\ 0 & 1 \end{pmatrix}$$

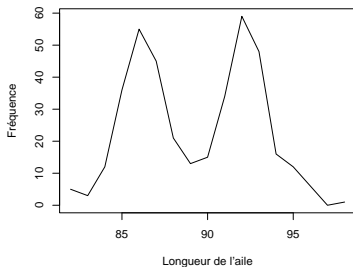
- Données : \mathbf{x}

\mathbf{x}				\mathbf{z}		
3.5	2.3	0.3	4.2	?	?	?
2.2	1.4	2.9	1.3	?	?	?
4.2	1.7	2.2	1.1	?	?	?
2.5	2.3	0.3	4.2	?	?	?
9.2	2.4	2.9	1.3	?	?	?
6.2	1.2	2.2	1.1	?	?	?

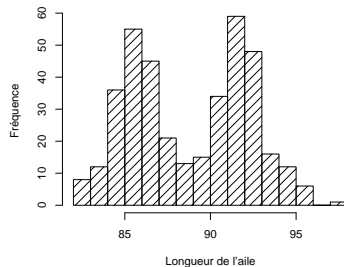
- Problème : estimer la matrice de classification \mathbf{z} à partir de \mathbf{x}

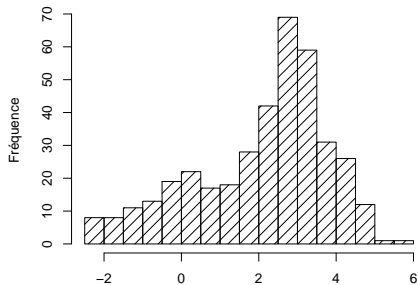
Longueur	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
Fréquence	5	3	12	36	55	45	21	13	15	34	59	48	16	12	6

Polygone des fréquences

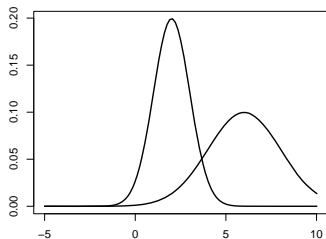


Histogramme

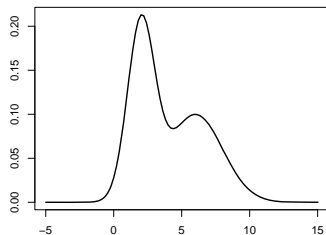


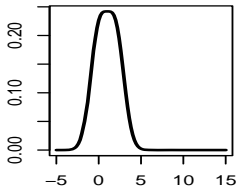


(a) Les composantes

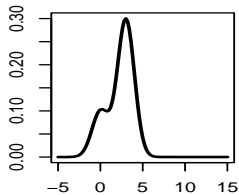


(b) Le mélange

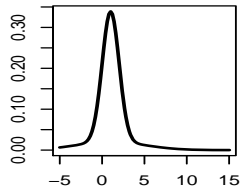




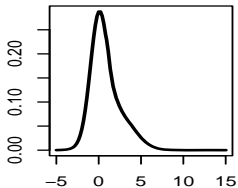
(a)



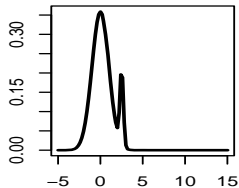
(b)



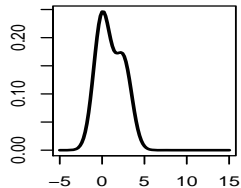
(c)



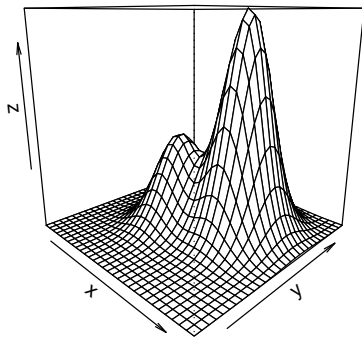
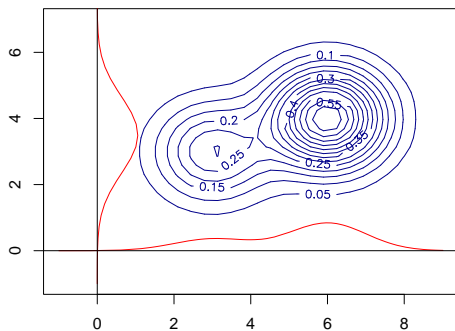
(d)



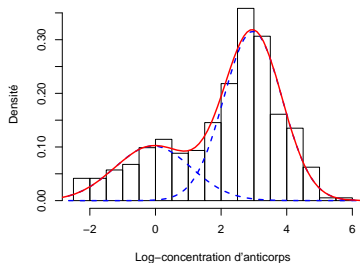
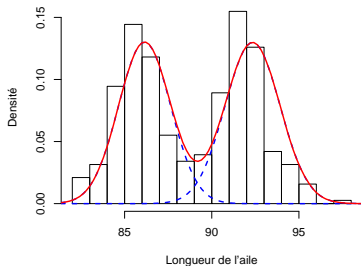
(e)



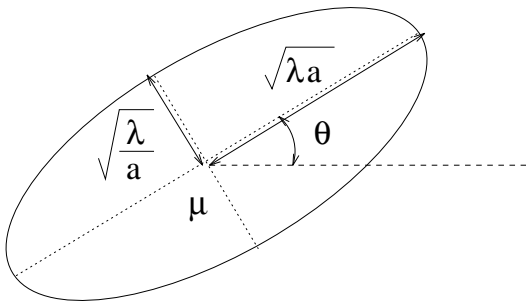
(f)



	Paramètres	π_1	π_2	μ_1	μ_2	σ_1^2	σ_2^2	nb d'itér.
Passereaux	initiaux	0.50	0.50	85	95	1	1	
	obtenus	0.49	0.51	86.1	92.3	2.5	2.2	54
Oreillons	initiaux	0.50	0.50	-3	5	1	1	
	obtenus	0.30	0.70	-0.07	2.98	1.35	0.79	221



$$\begin{pmatrix} 0.3 & 0.6 & 0.1 \\ 0.8 & 0.1 & 0.1 \\ 0 & 0 & 1 \\ 0.4 & 0.5 & 0.1 \\ 0.2 & 0.1 & 0.7 \end{pmatrix}$$



$$A = \begin{bmatrix} a & 0 \\ 0 & 1/a \end{bmatrix}$$

$$D = \begin{bmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix}$$

