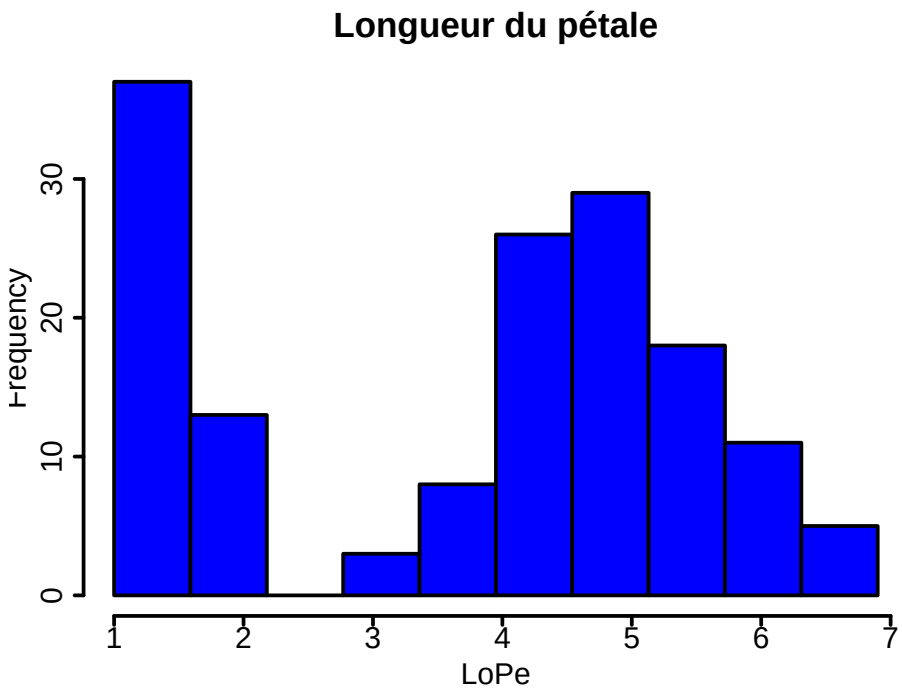
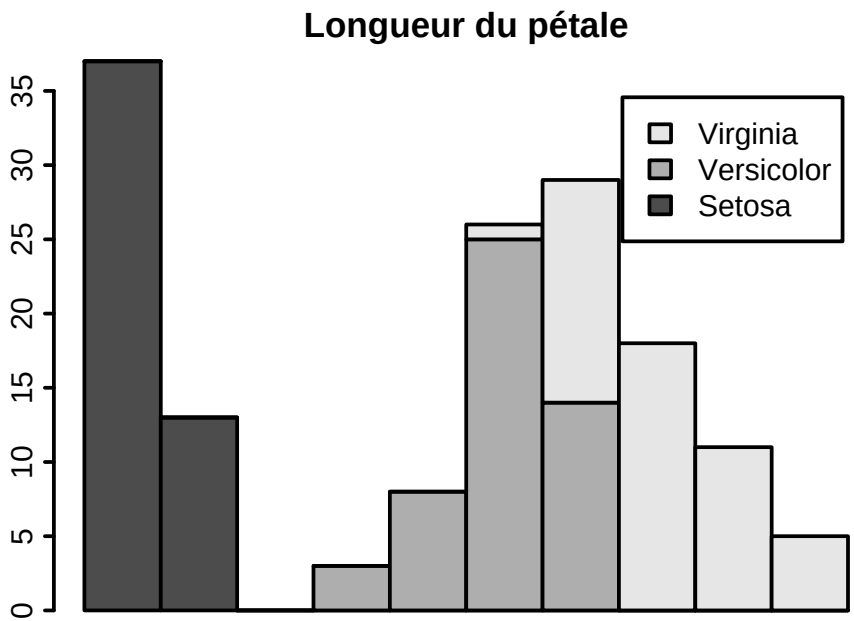
Statistiques élémentaires des données Iris

LoSe	LaSe	LoPe	LaPe
Min. :4.300	Min. :2.000	Min. :1.000	Min. :0.100
1st Qu.:5.100	1st Qu.:2.800	1st Qu.:1.600	1st Qu.:0.300
Median :5.800	Median :3.000	Median :4.350	Median :1.300
Mean :5.843	Mean :3.057	Mean :3.758	Mean :1.199
3rd Qu.:6.400	3rd Qu.:3.300	3rd Qu.:5.100	3rd Qu.:1.800
Max. :7.900	Max. :4.400	Max. :6.900	Max. :2.500

Histogramme : longueur du pétale des données Iris





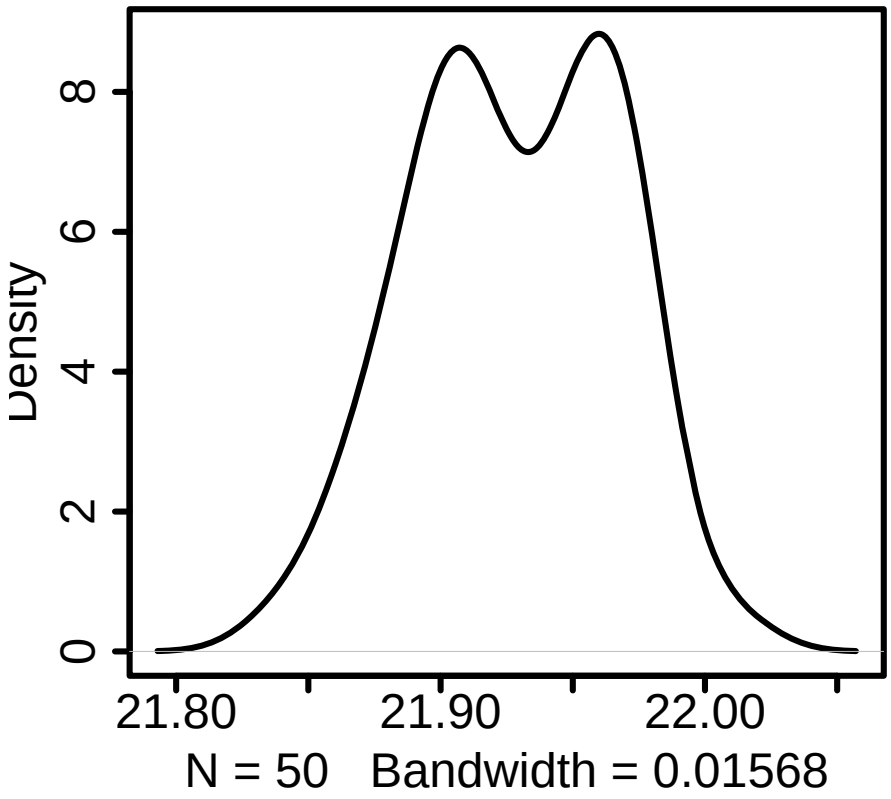
Exemple de noyaux

- Rectangulaire : $K(x) = \mathbb{1}[-0.5, +0.5](x)$
- Triangulaire : $K(x) = (1 - |x|).\mathbb{1}[-1, +1](x)$
- Gaussien : $K(x) = \frac{1}{\sqrt{2\pi}} exp(-\frac{1}{2}x^2)$
- Epanechnikov : $K(x) = \frac{3}{4\sqrt{5}}(1 - x^2/5).\mathbb{1}[-\sqrt{5}, +\sqrt{5}](x)$
- Lejeune : $K(x) = \frac{105}{64}(1 - x^2)^2(1 - 3x^2).\mathbb{1}[-1, +1](x)$

Exemple d'estimation de la densité

21.86	21.92	21.91	21.97	22.01	21.84	21.90	21.91	21.98	21.96
21.88	21.91	21.92	21.95	21.95	21.90	21.89	21.91	21.89	21.95
21.92	21.91	21.93	21.98	21.97	21.87	21.87	21.96	21.96	21.96
21.90	21.89	21.91	21.98	21.95	21.87	21.90	21.97	21.95	21.94
21.90	21.89	21.97	21.97	21.97	21.93	21.92	21.97	21.94	21.95

Estimation avec noyau gausssier



Histogramme

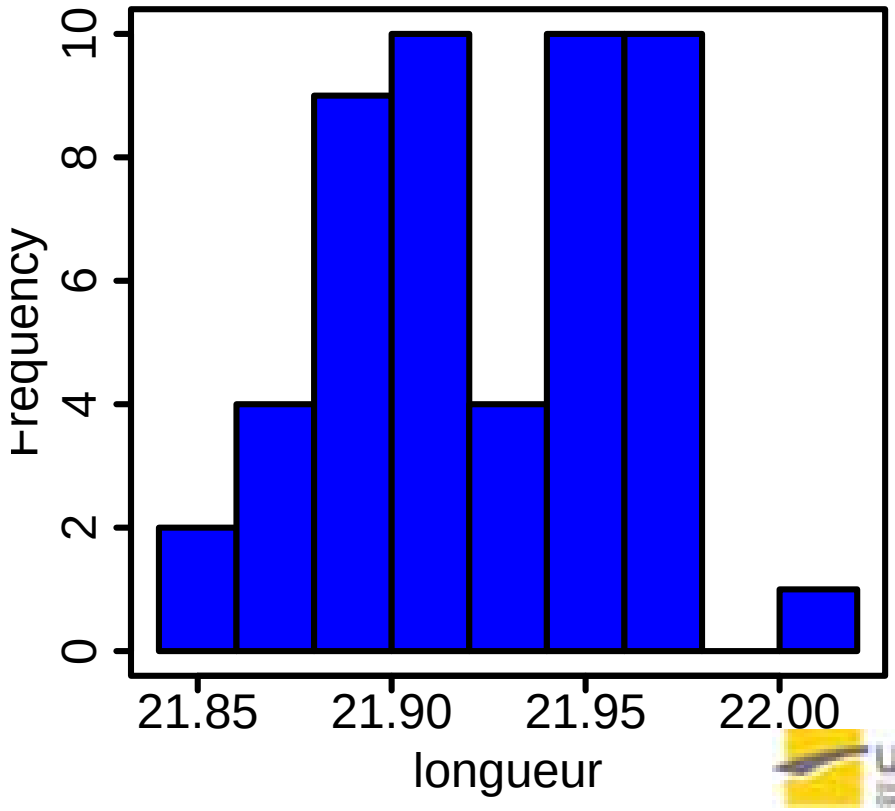
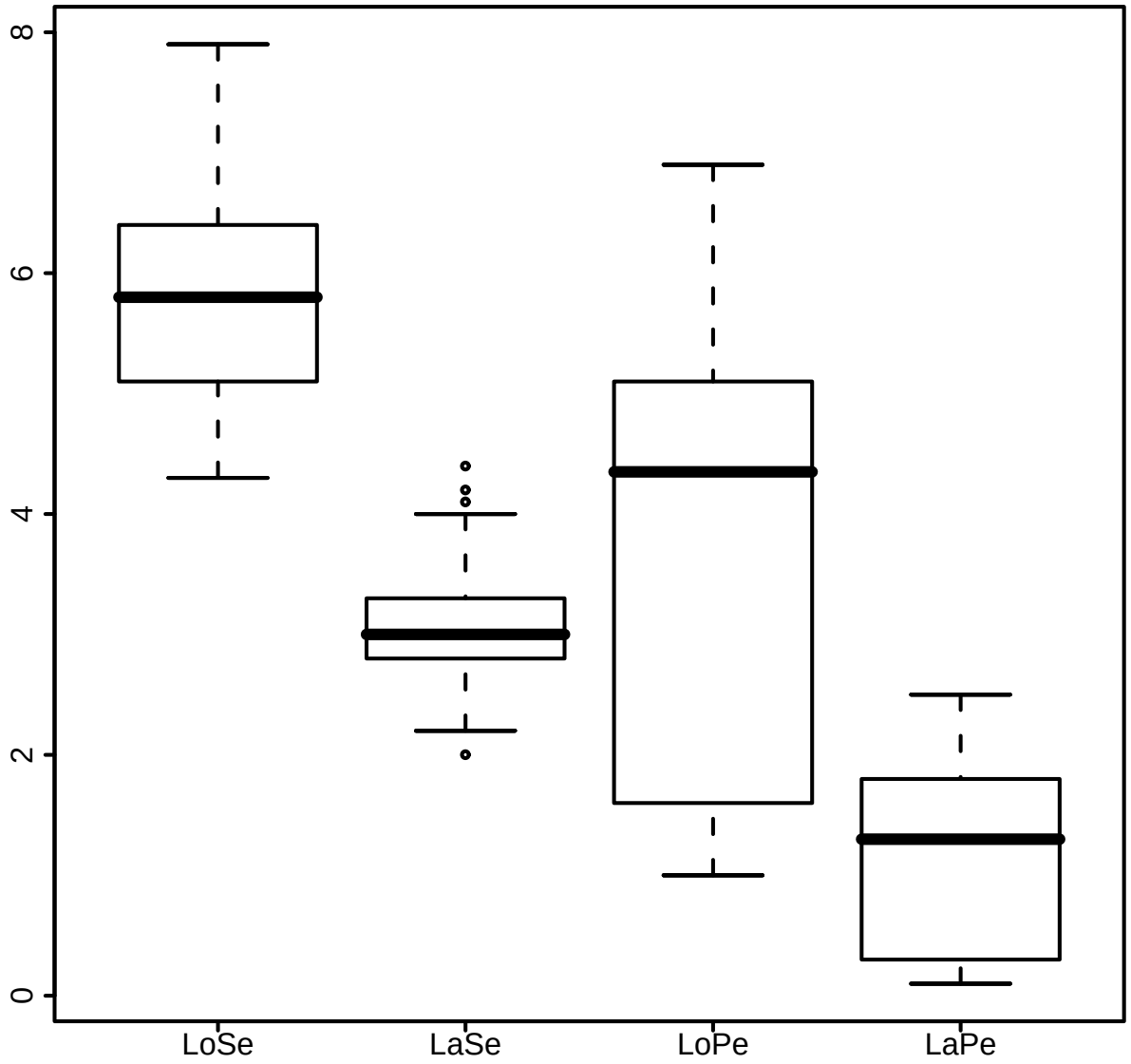


Diagramme en boîte

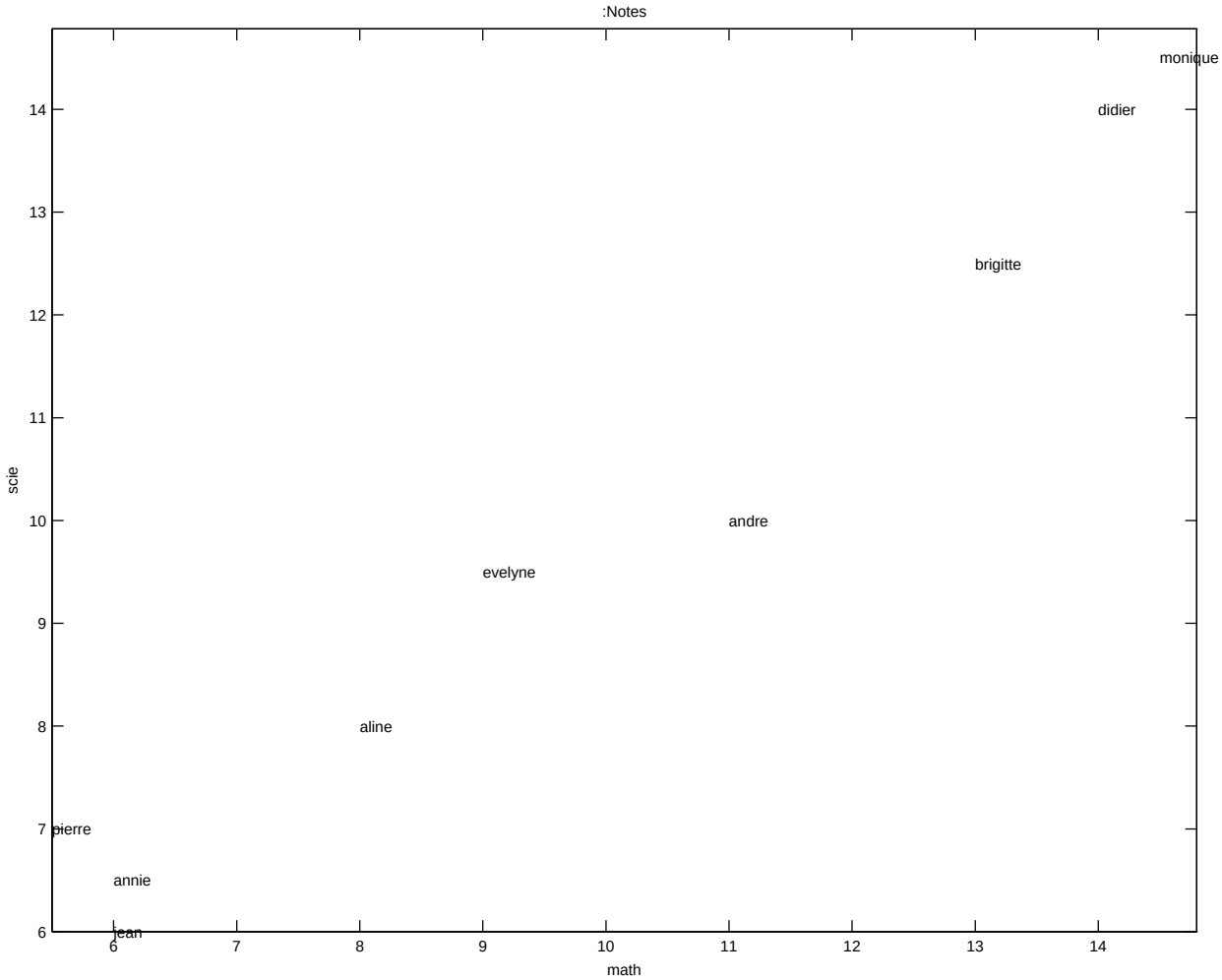


Graphique de dispersion

jean	6.0	6.0
alin	8.0	8.0
anni	6.0	7.0
moni	14.5	14.5
didi	14.0	14.0
andr	11.0	10.0
pier	5.50	7.0
brig	13.0	12.5
evel	9.0	9.5

Graphique de dispersion

jean	6.0	6.0
alin	8.0	8.0
anni	6.0	7.0
moni	14.5	14.5
didi	14.0	14.0
andr	11.0	10.0
pier	5.50	7.0
brig	13.0	12.5
evel	9.0	9.5

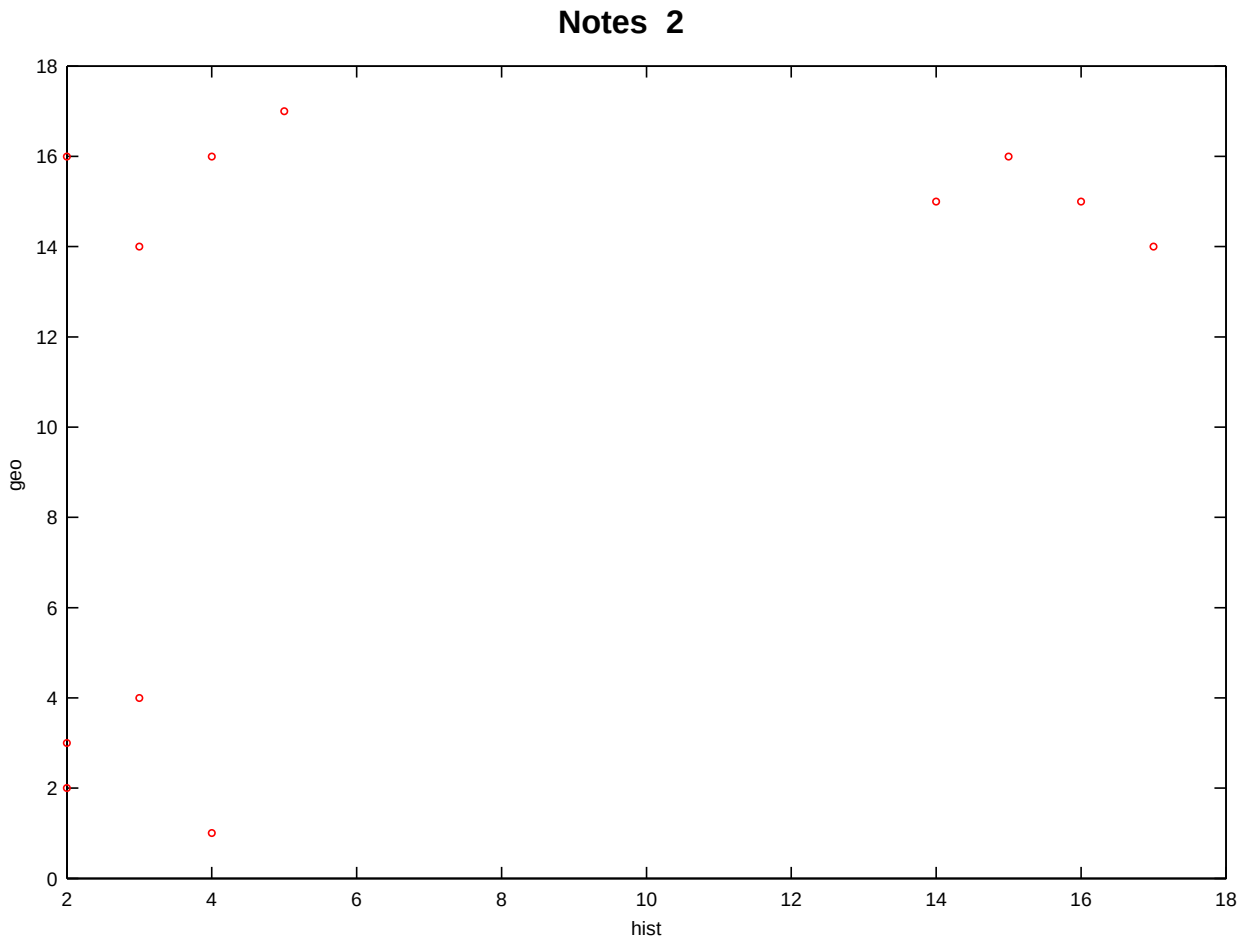


Graphique de dispersion (suite)

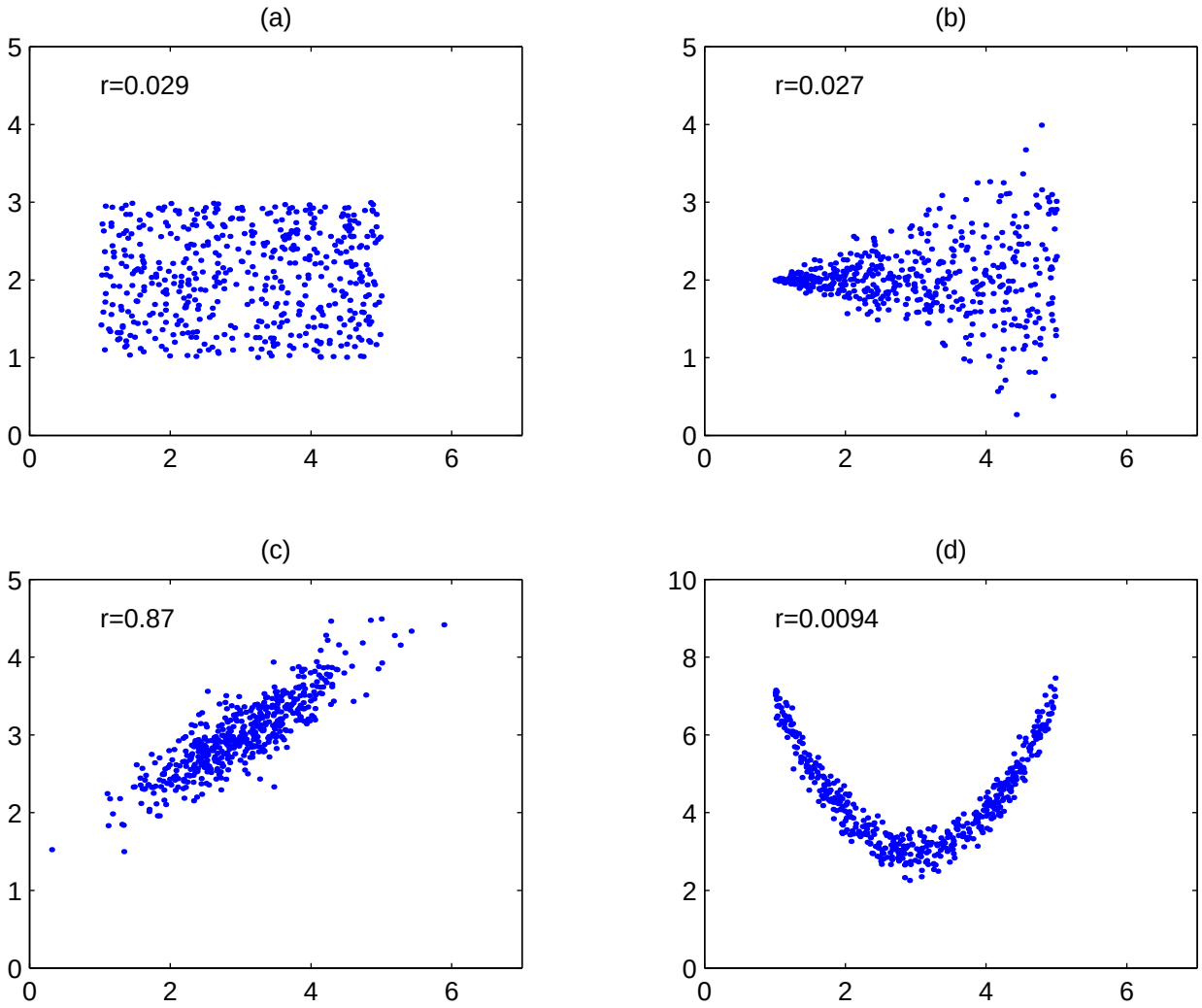
1	15	16
2	2	3
3	4	16
4	16	15
5	3	4
6	3	14
7	4	1
8	17	14
9	5	17
10	2	2
11	14	15
12	2	16

Graphique de dispersion (suite)

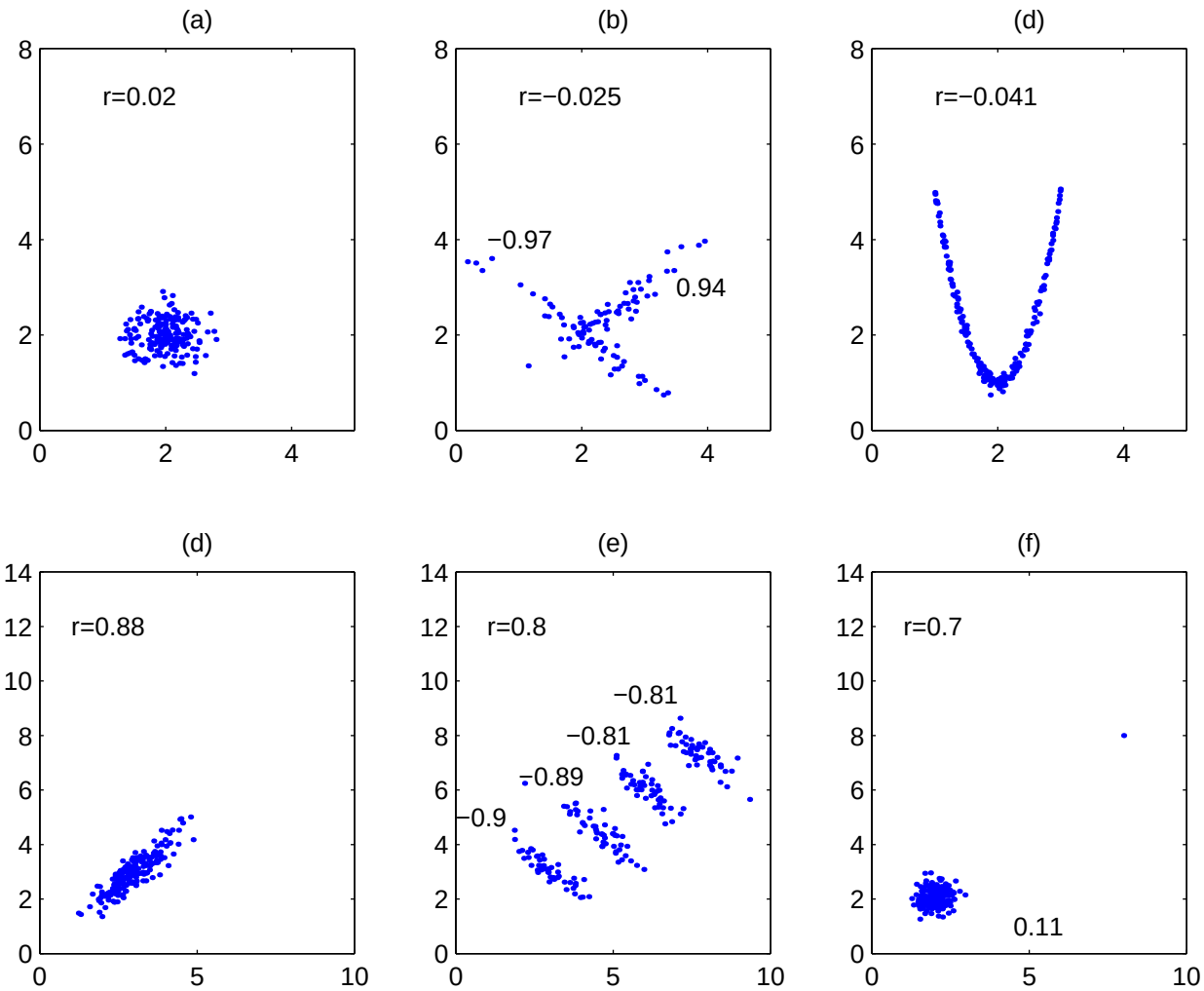
1	15	16
2	2	3
3	4	16
4	16	15
5	3	4
6	3	14
7	4	1
8	17	14
9	5	17
10	2	2
11	14	15
12	2	16



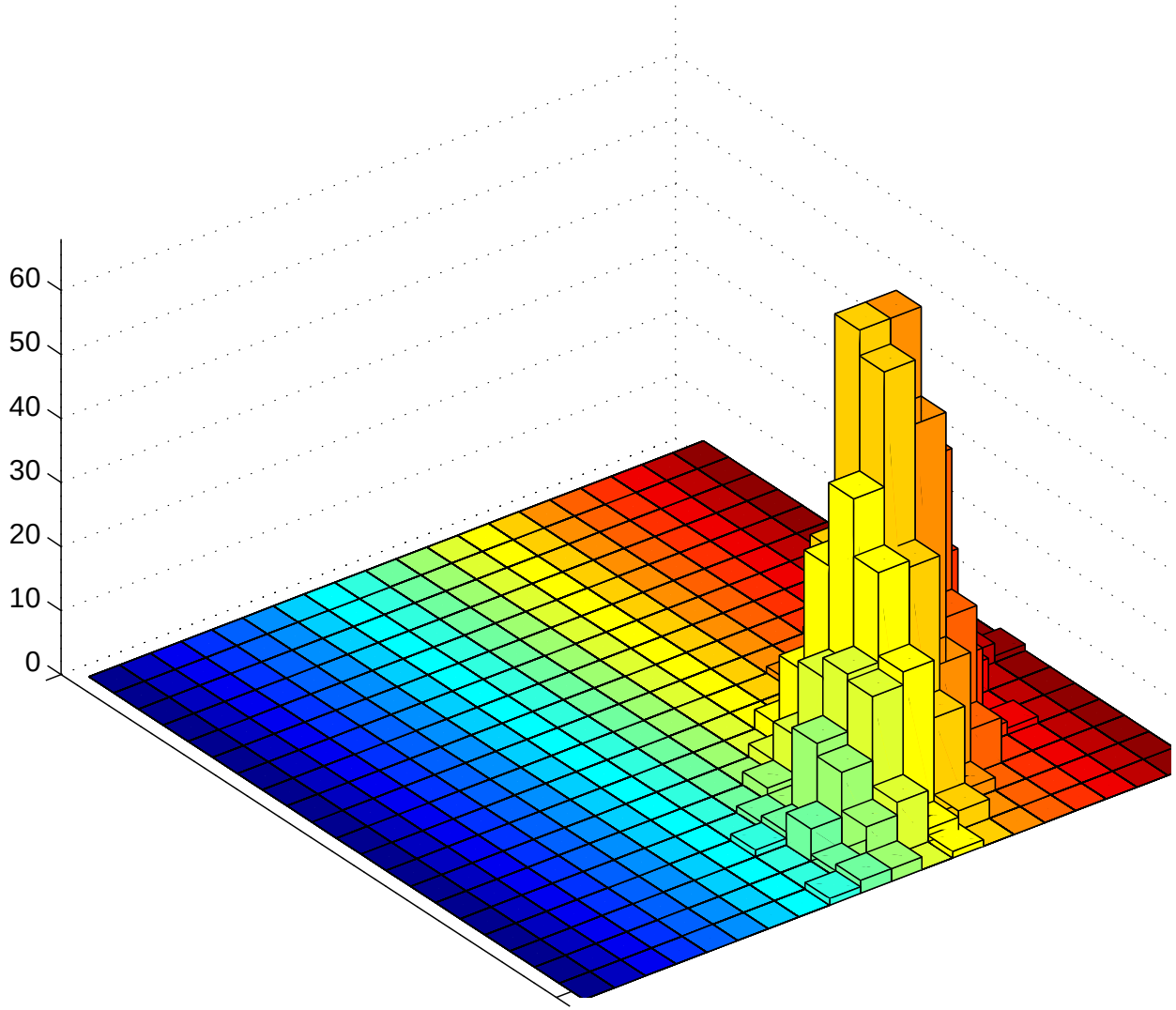
Exemple de corrélation



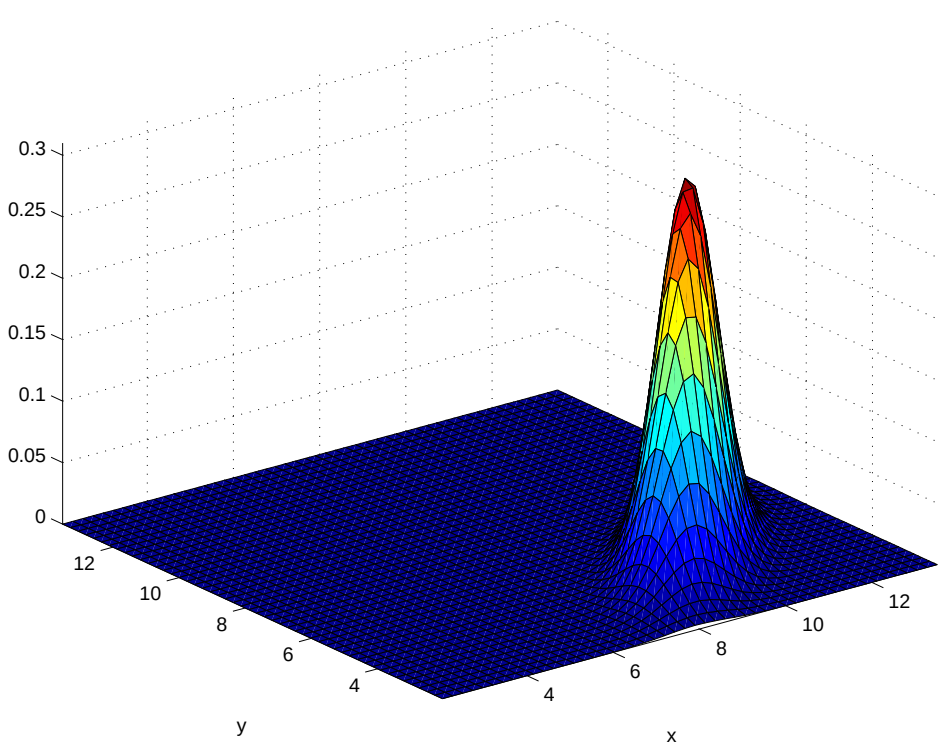
Exemple de corrélation (suite)

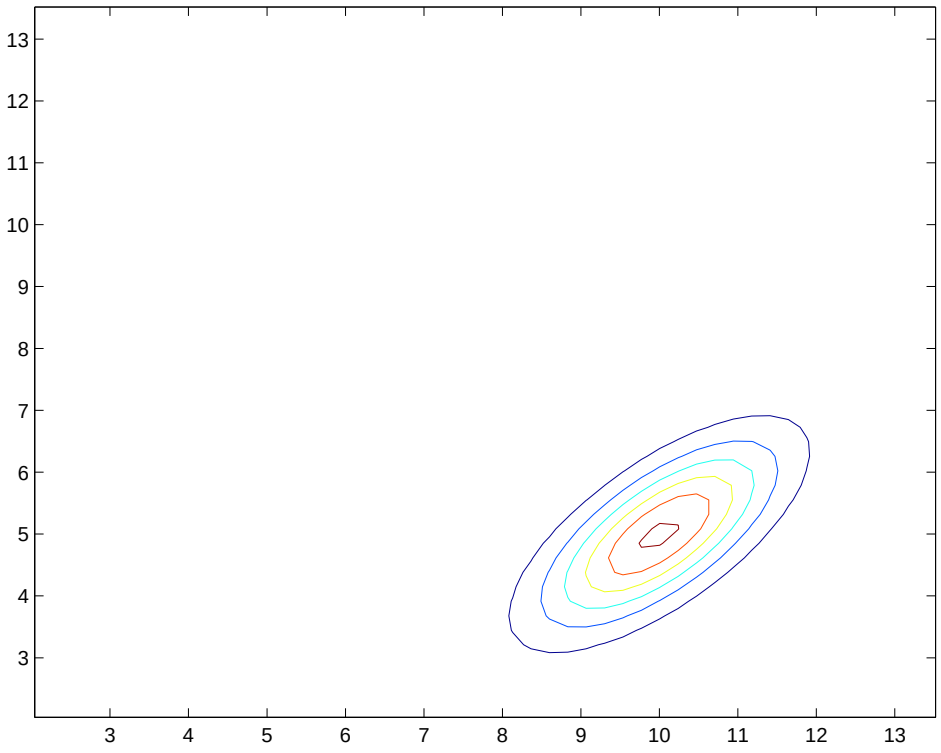


Histogramme bidimensionnelle



Estimation de densité bidimensionnelle





Covariance et corrélation des données Iris

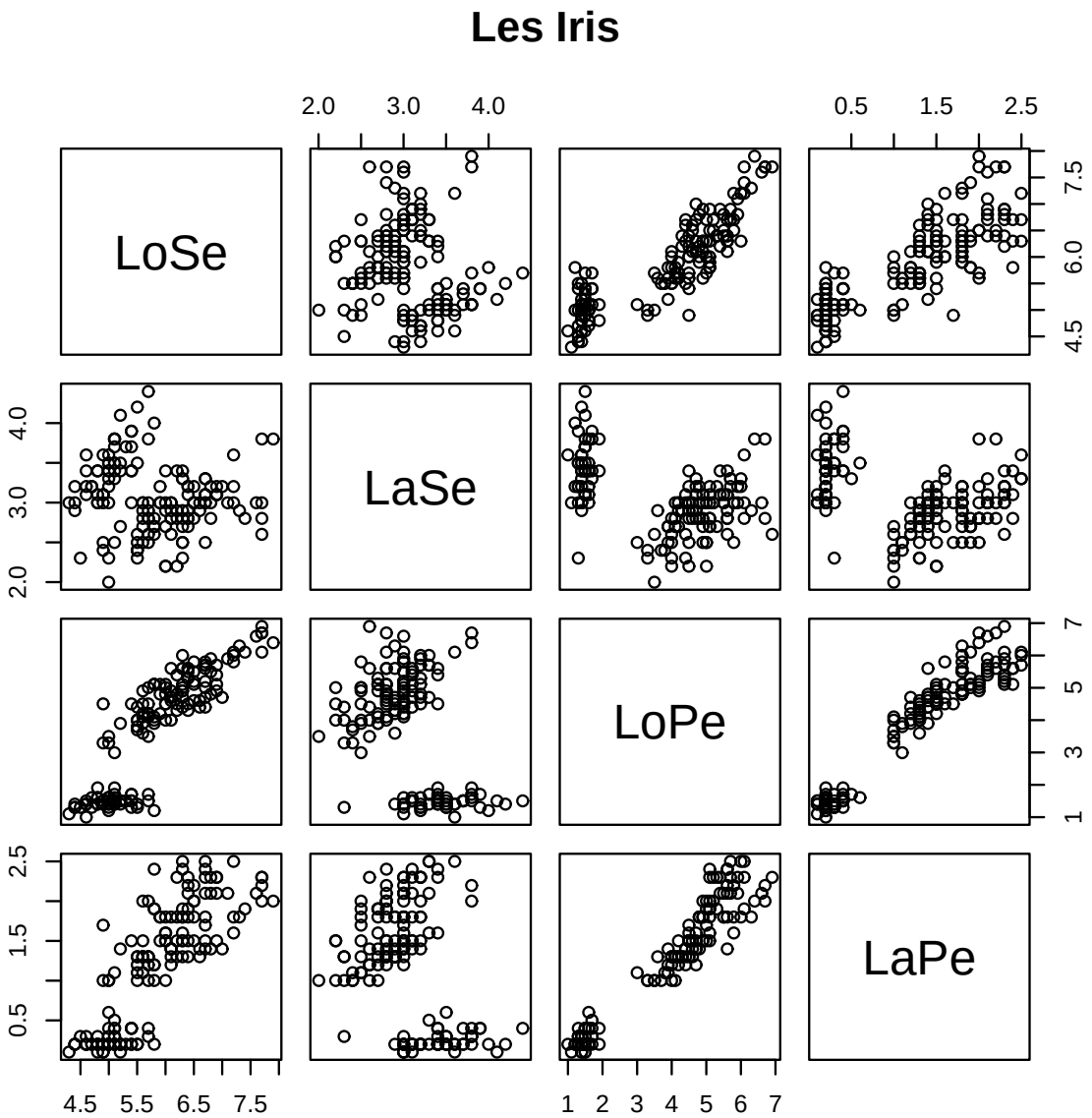
Matrice de covariance

	LoSe	laSe	LoPe	laPe
LoSe	0.69	−0.04	1.3	0.52
laSe	−0.04	0.19	−0.3	−0.12
LoPe	1.27	−0.33	3.1	1.30
laPe	0.52	−0.12	1.3	0.58

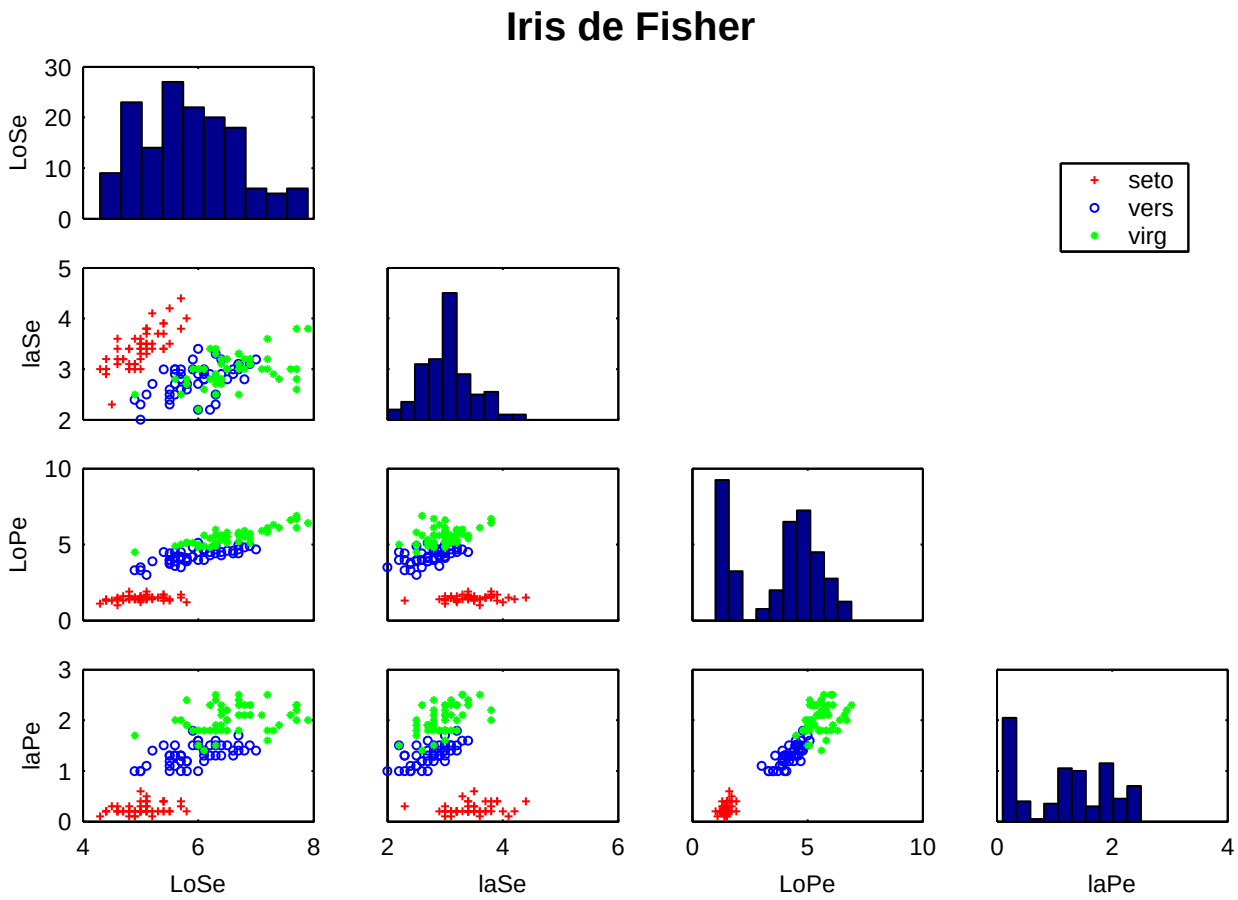
Matrice de corrélation

	LoSe	laSe	LoPe	laPe
LoSe	1.00	−0.12	0.9	0.82
laSe	−0.12	1.00	−0.4	−0.37
LoPe	0.87	−0.43	1.0	0.96
laPe	0.82	−0.37	1.0	1.00

Graphique matriciel



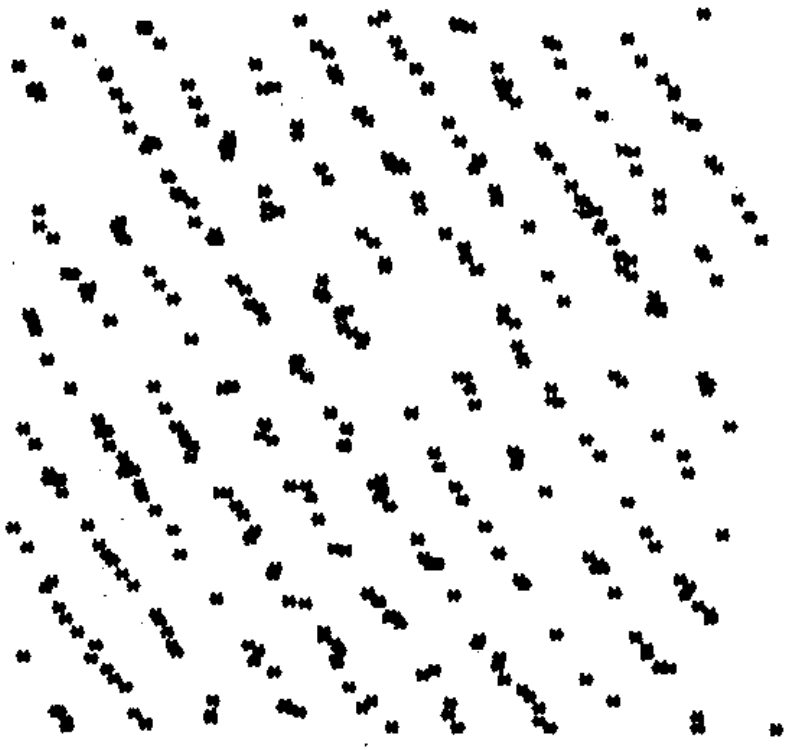
Graphique matriciel avec variable qualitative

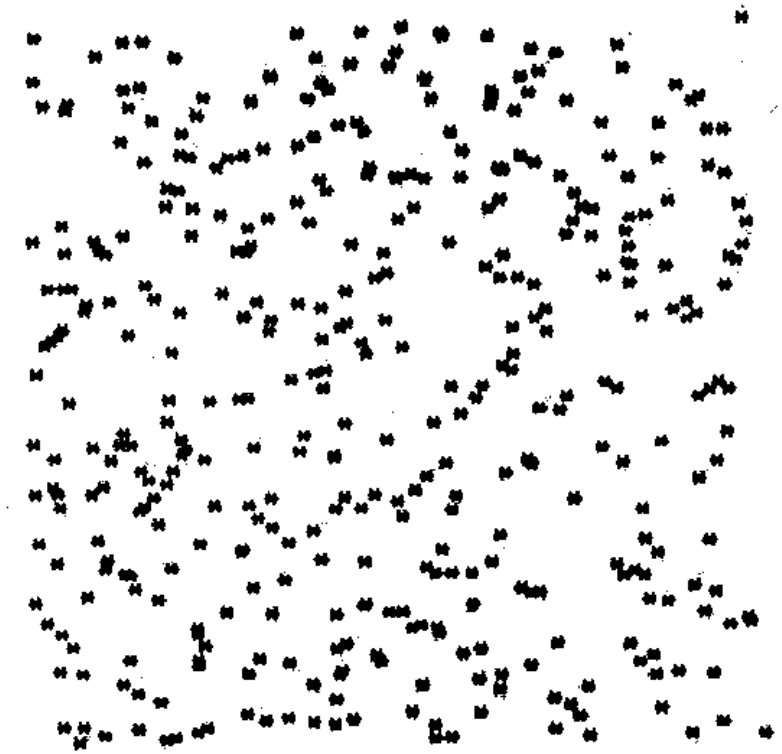


Pourcentage de de points situées dans $[-r, +r]^p = r^p$

		p				
		1	2	5	10	100
	0.50	0.50	0.25	0.031	0.00098	7.910^{-31}
r	0.75	0.75	0.56	0.24	0.056	3.210^{-13}
	0.95	0.95	0.90	0.77	0.60	0.0059

Problème lié à la projection





Description de la variable Espèce pour les Iris