Vianey Maravilla Pérez 5AM1 Analítica y Visualización de datos

Proyecto 03:

Programa en R que permita calcular la distancia de Mahalanobis sobre el conjunto de datos lris, para las 3 clases de flores que están descritas en el conjunto de datos.

- Cuantificar el valor de la distancia de Mahalanobis entre las flores: Setosa,
 Versicolor y Virginica, tomando como base la longitud y anchura del sépalo y pétalo de cada flor.
- Graficar los valores de las distancias calculadas.

Codificación:

```
# Vianew Maraxilla Pérez
# 5MM1
# Analitica Y Visualización de Datos
# Proyecto 3
# Descripción:
# Proyerama en R que permita calcular la distancia de Mahalanobis sobre el conjunto de datos Iris, para las 3 clases
# de flores que están descritas en el conjunto de datos.
# de flores que están descritas en el conjunto de datos.
# Cuantificar el valor de la distancia de Mahalanobis entre las flores: Setosa.
# de flores que están descritas en el conjunto de datos.
# Cuantificar el valor de la distancia de Mahalanobis entre las flores: Setosa.
# de flores que están descritas en el conjunto de datos.

# Graficar los valores de las distancias calculadas.
# Graficar los valores de las distancias calculadas.
# data <- data. frame(firis)
# data <- data. frame(data dataSpecies)
# dower_type = levels(factor(dataSpecies))
# dower_type = levels(factor(dataSpecies))
# versicolor <- data. frame(data[dataSpecies == flower_type[3], c(1, 2, 3, 4, 5)])
# virginica <- data. frame(data[dataSpecies == flower_type[3], c(1, 2, 3, 4, 5)])
# virginica <- data. frame(data[dataSpecies == flower_type[3], c(1, 2, 3, 4, 5)])
# versicolorDe mahalanobis. dist(versicolor], flores mahalanobis. dist(versicolor], flores mahalanobis.
# de flores que mahalanobis. dist(versicolor], flores mahalanobis.
# de flores que mahalanobis. dist(versicolor], flores mahalanobis.
# de flores que mahalanobis.
#
```

```
means_list <- c(means_list, suma / row_no)</pre>
49
50 -
         return(means_list)
52 - }
54 mult_mat <- function(mat1, mat2) {
        row_no1 <- dim(mat1)[1]
row_no2 <- dim(mat2)[1]
56
        col_no1 <- dim(mat1)[2]
col_no2 <- dim(mat2)[2]</pre>
58
         if(col_no1 == row_no2) {
59 \forall
           new_mat <- data.frame()
for(a in 1:col_no2) {
60
61 -
62
              rown <- c()
              for(i in 1:row_no1) {
63 -
                 suma <- 0
64
65 →
                 for(j in 1:col_no1) {
66
                   suma <- suma + (mat1[i,j] * mat2[j,a])</pre>
67 -
68
                 rown <- c(rown, suma)
69 -
70 -
              if(dim(new_mat)[1] == 0) {
71
72 -
73
74 -
                 new_mat <- cbind(rown)</pre>
                 new_mat <- cbind(new_mat, rown)</pre>
75 ^
76
           return(new_mat)
77 -
78 - }
79
80 mahalanobis_dist <- function(data) {
81
        cov_matrix <- cov(data)</pre>
        means_data <- means(data)
82
        row_no <- dim(data)[1]
col_no <- dim(data)[2]
83
84
85
         identity_matrix <- diag(row_no)</pre>
86
        ones_matrix <- matrix(1, row_no, row_no)</pre>
87
         identity_one <- identity_matrix - ((1 / row_no) * ones_matrix)</pre>
        t_data <- t(data)
cov_matrix_inv <- solve(cov_matrix)
88
89
90
         first_step <- mult_mat(identity_one, data)</pre>
        second_step <- mult_mat(first_step, cov_matrix_inv)
third_step <- mult_mat(second_step, t_data)
four_step <- mult_mat(third_step, identity_one)
mahalanobis_dists <- diag(four_step)</pre>
91
92
93
94
95
         return(mahalanobis_dists)
96 -
97
```

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Resultados:

> main()										
[1] " Maha]	anobis Seto	sa D."								
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
0.4491138	2.0810942	1.2843351	1.7062070	0.7616854	3.7126474	3.4241961	0.3434392	2.9964765	3.2000859	1.8909526
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
2.0148794	2.9473331	7.0402099	10.2220770	7.6538032	5.7423687	0.6362547	5.1857747	1.6124127	5.3490587	2.7223552
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
11.0444280	7.2303753	9.7479738	3.7705104	2.5256872	0.8291292	1.3230148	2.1743957	1.9945061	4.8891115	7.6992784
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
5.2480239	1.2669810	3.3018243	5.7212698	3.0856490	3.2702461	0.5893473		12.3276387		12.3100577
rown	rown	rown	rown	rown	rown	0.3033473	1.00-10-17 2	12.32/030/	4.2010300	12.31003//
8.6011598	2.1946518	2.7557423	1.4888677	1.2527278	0.4947559					
			1.40000//	1.232/2/0	0.494/339					
[1] "versicolor_mahalanobis"										
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
6.0916551	2.3973078	3.5631825	3.9178610	2.4558493	3.2527816	3.1179808	4.7361110	2.9112176	4.3762012	6.4308470
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
2.6553116	6.1610471	1.7677621	5.5411161	4.2747500	3.5278668	6.5262626	12.4894655	1.4082478	8.5146136	1.9491202
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
6.0671797	7.1337117	1.7597667	2.9199945	3.7736387	4.7325800	0.9725275	4.4510573	1.6366303	2.7631832	0.8492779
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
8.0889349	5.9027716	5.5893623	2.4805283	5.7578365	2.2875030	1.6242992	5.3823881	1.2944391	0.4976204	4.4743536
rown	rown	rown	rown	rown	rown					
0.7543141	4.2302567	1.0676174		10.2907920	0.3783153					
	ica_mahalan		0.7723010	10.230/320	0.5/05155					
rown	rown		rown	rown	rown	rown	rown	rown	rown	rown
8.8020901	1.8944347	rown 0.8333777	2.1093471	1.5855332	rown 4.1651756	7.9943130	3.6681851	3.4851203	4.4487424	2.8049311
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
0.8882618	0.8501882	3.6451283	5.6123019	1.8765129	1.1395765		13.6690945	6.4187616	1.2650472	2.6139404
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
6.6556667	3.1866510	1.2983426	3.1886575	3.3050360	2.5594497	1.0711906	5.0318804	3.3292942	10.8263574	1.7500469
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
4.2847010	8.7844642	6.3042090	4.4726436	2.1692940	3.0674703	2.3114137	2.1721288	8.3131469	1.8944347	1.3352612
rown	rown	rown	rown	rown	rown					
3.1401967	4.5454882	4.0076980	1.1118083	3.9418920	2.6910812					
> source("C	:/Users/via	ne/Music/ES	SCOM/Análisi	s v visuali	zación de d	latos/Proved	to 03.R")			
> source("C:/Users/viane/Music/ESCOM/Análisis y visualización de datos/Proyecto 03.R") [1] " Mahalanobis Setosa D."										
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
0.4491138	2.0810942	1.2843351	1.7062070	0.7616854	3.7126474	3.4241961	0.3434392	2.9964765	3.2000859	1.8909526
rown	rown	rown	rown	rown	7./1204/4 rown	rown	rown	rown		
2.0148794	2.9473331	7.0402099	10.2220770	7.6538032	5.7423687	0.6362547	5.1857747	1.6124127	rown 5.3490587	rown 2.7223552
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
11.0444280	7.2303753	9.7479738	3.7705104	2.5256872	0.8291292	1.3230148	2.1743957	1.9945061	4.8891115	7.6992784
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
5.2480239	1.2669810	3.3018243	5.7212698	3.0856490	3.2702461	0.5893473	1.6848472	12.3276387	4.2010386	12.3100577
rown	rown	rown	rown	rown	rown					
8.6011598	2.1946518	2.7557423	1.4888677	1.2527278	0.4947559					

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8.0011398 [1] "versic	2.1940318 olor_mahala	2./33/423 unobis"	1.4000077	1.232/2/0	0.454/ 555					
rown 6.0916551	rown 2.3973078	rown 3.5631825	rown 3.9178610	rown 2.4558493	rown 3.2527816				rown 4.3762012	rown 6.4308470
rown 2.6553116	rown 6.1610471	rown 1.7677621	rown 5.5411161	rown 4.2747500	rown 3.5278668	6.5262626	12.4894655	rown 1.4082478	rown 8.5146136	rown 1.9491202
rown 6.0671797	rown 7.1337117	rown 1.7597667	rown 2.9199945	rown 3.7736387	rown 4.7325800	0.9725275	4.4510573	rown 1.6366303	rown 2.7631832	rown 0.8492779
rown 8.0889349	rown 5.9027716	rown 5.5893623	rown 2.4805283	rown 5.7578365	2.2875030	1.6242992		rown 1.2944391	rown 0.4976204	rown 4.4743536
rown 0.7543141 [1] "virgin	rown 4.2302567 ica mahalan	rown 1.0676174	rown 0.7725618	rown 10.2907920	rown 0.3783153					
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
8.8020901 rown	1.8944347 rown	0.8333777 rown	2.1093471 rown	1.5855332 rown	4.1651756 rown			3.4851203 rown	4.4487424 rown	2.8049311 rown
0.8882618 rown	0.8501882 rown	3.6451283 rown	5.6123019 rown	1.8765129 rown	1.1395765 rown	9.4800318	13.6690945	6.4187616 rown	1.2650472 rown	2.6139404 rown
6.6556667	3.1866510	1.2983426	3.1886575	3.3050360	2.5594497	1.0711906	5.0318804	3.3292942	10.8263574	1.7500469
4.2847010	rown 8.7844642	rown 6.3042090	rown 4.4726436	rown 2.1692940	3.0674703	2.3114137		rown 8.3131469	rown 1.8944347	rown 1.3352612
3.1401967	rown 4.5454882	rown 4.0076980	rown 1.1118083	rown 3.9418920	rown 2.6910812					
> main() [1] " Mahal	anobis Seto	sa D."								
rown 0.4491138	rown 2.0810942	rown 1.2843351	rown 1.7062070	rown 0.7616854	rown 3.7126474				rown 3.2000859	rown 1.8909526
rown 2.0148794	rown 2.9473331	rown 7.0402099	rown 10.2220770	rown 7.6538032	rown 5.7423687			rown 1.6124127	rown 5.3490587	rown 2.7223552
rown 11.0444280	rown 7.2303753	rown 9.7479738	rown 3.7705104	rown 2.5256872	rown 0.8291292			rown 1.9945061	rown 4.8891115	rown 7.6992784
rown 5.2480239	rown 1.2669810	rown 3.3018243	rown 5.7212698	rown 3.0856490	rown 3.2702461	rown	rown	rown 12.3276387	rown 4.2010386	rown 12.3100577
rown 8.6011598	rown 2.1946518	rown 2.7557423	rown 1.4888677	rown 1.2527278	rown 0.4947559					
[1] "versic	olor_mahala									
rown 6.0916551	rown 2.3973078	rown 3.5631825	rown 3.9178610	rown 2.4558493	rown 3.2527816				rown 4.3762012	rown 6.4308470
rown	rown	rown	rown	rown	rown	rown	rown	rown	rown	rown
2.6553116 rown	6.1610471 rown	1.7677621 rown	5.5411161 rown	4.2747500 rown	3.5278668 rown		12.4894655 rown	1.4082478 rown	8.5146136 rown	1.9491202 rown
6.0671797	7.1337117	1.7597667	2.9199945	3.7736387	4.7325800	0.9725275	4.4510573	1.6366303	2.7631832	0.8492779
8.0889349	rown 5.9027716	rown 5.5893623	rown 2.4805283	rown 5.7578365	rown 2.2875030	1.6242992		rown 1.2944391	rown 0.4976204	rown 4.4743536
rown 0.7543141	rown 4.2302567	rown 1.0676174	rown 0.7725618	rown 10.2907920	rown 0.3783153					
[1] "virgini										
		rown 0.8333777								rown 8049311
rown 0.8882618	rown 0.8501882	rown 3.6451283				rown 9.4800318 1				rown 6139404
rown 6.6556667	rown 3.1866510	rown 1.2983426	rown 3.1886575	rown 3.3050360	rown 2.5594497	rown 1.0711906	rown 5.0318804 3	rown .3292942 10	rown .8263574 1.	rown 7500469
rown 4.2847010	rown 8.7844642	rown 6.3042090	rown 4.4726436	rown 2.1692940		rown 2.3114137	rown 2.1721288 8	rown .3131469 1	rown .8944347 1.	rown 3352612
rown 3.140 <u>1</u> 967	rown 4.5454882	rown 4.0076980	rown 1.1118083	rown 3.9418920	rown 2.6910812					



