Tarea 2

Christian Badillo, Luis Nuñez, Luz Maria Santana, & Sealtiel Pichardo

Tabla de contenidos

1 Parte 4

Vemos los datos.

Tabla 1: Primeras diez observaciones.

Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	MnO	BaO	kiln
18.8	9.52	2.00	0.79	0.40	3.20	1.01	0.077	0.015	1
16.9	7.33	1.65	0.84	0.40	3.05	0.99	0.067	0.018	1
18.2	7.64	1.82	0.77	0.40	3.07	0.98	0.087	0.014	1
16.9	7.29	1.56	0.76	0.40	3.05	1.00	0.063	0.019	1
17.8	7.24	1.83	0.92	0.43	3.12	0.93	0.061	0.019	1
18.8	7.45	2.06	0.87	0.25	3.26	0.98	0.072	0.017	1
16.5	7.05	1.81	1.73	0.33	3.20	0.95	0.066	0.019	1
18.0	7.42	2.06	1.00	0.28	3.37	0.96	0.072	0.017	1
15.8	7.15	1.62	0.71	0.38	3.25	0.93	0.062	0.017	1
14.6	6.87	1.67	0.76	0.33	3.06	0.91	0.055	0.012	1

Dado que las escalas de los datos son distintas, se usará la distancia de Mahalanobis para calcular la distancia entre las observaciones.

```
# Función Para Calcular la distancia de Mahalanobis.
mah <- function(x, cx = NULL) {
  if(is.null(cx)) cx <- cov(x)
  out <- lapply(1:nrow(x), function(i) {
    mahalanobis(x = x,
                center = do.call("c", x[i, ]),
                cov = cx)
  })
```

```
  return(as.dist(do.call("rbind", out)))
}

dist.matrix <- as.matrix(mah(data), nrows = 45, ncols = 45)
```

Tabla 2: Matrix de Distancias

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0.00	14.62	10.41	17.20	15.99	14.45	35.88	15.85	19.80	19.86	29.09	30.84	27.11	12.22	12.15
14.62	0.00	6.78	0.50	1.47	4.87	16.23	3.85	1.61	4.92	12.28	11.39	11.77	1.89	3.65
10.41	6.78	0.00	10.03	9.19	4.27	23.66	5.10	10.63	7.96	18.92	19.36	15.24	8.28	9.61
17.20	0.50	10.03	0.00	1.99	6.92	20.00	6.06	1.15	6.39	12.85	14.30	15.48	2.46	4.41
15.99	1.47	9.19	1.99	0.00	5.80	14.97	4.44	3.50	8.39	15.65	12.71	14.22	2.47	5.15
14.45	4.87	4.27	6.92	5.80	0.00	16.26	0.73	8.67	10.35	18.20	13.19	11.95	6.94	9.34
35.88	16.23	23.66	20.00	14.97	16.26	0.00	11.12	22.19	22.75	32.87	3.69	5.22	18.29	20.42
15.85	3.85	5.10	6.06	4.44	0.73	11.12	0.00	7.08	8.46	18.27	8.91	8.52	6.48	9.23
19.80	1.61	10.63	1.15	3.50	8.67	22.19	7.08	0.00	3.57	12.01	14.54	16.31	5.36	8.09
19.86	4.92	7.96	6.39	8.39	10.35	22.75	8.46	3.57	0.00	9.24	13.08	14.14	10.94	13.16
29.09	12.28	18.92	12.85	15.65	18.20	32.87	18.27	12.01	9.24	0.00	17.52	18.72	15.74	15.41
30.84	11.39	19.36	14.30	12.71	13.19	3.69	8.91	14.54	13.08	17.52	0.00	1.67	14.86	16.14
27.11	11.77	15.24	15.48	14.22	11.95	5.22	8.52	16.31	14.14	18.72	1.67	0.00	13.22	13.37
12.22	1.89	8.28	2.46	2.47	6.94	18.29	6.48	5.36	10.94	15.74	14.86	13.22	0.00	0.61
12.15	3.65	9.61	4.41	5.15	9.34	20.42	9.23	8.09	13.16	15.41	16.14	13.37	0.61	0.00

Nota.
Primeras 15 Observaciones.