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> #2020/11/06 (五), 109 學年第一學期 資料科學應用 R 作業(2)
> #學號: A107260036　姓名: 顏郁芹
> #ex1.13(a)
> lm.obj <- lm(airquality$Wind ~ airquality$Temp)
> lm.anova <- anova(lm.obj)
> lm.summary <- summary(lm.obj)
> class(lm.anova)
[1] "anova"         "data.frame"
> str(lm.anova)
Classes 'anova' and 'data.frame':   2 obs. of    5 variables:
 $ Df      : int    1 151
 $ Sum Sq : num    396 1491
 $ Mean Sq: num    395.71 9.87
 $ F value: num    40.1 NA
 $ Pr(>F) : num    2.64e-09 NA
 - attr(*, "heading")= chr [1:2] "Analysis of Variance Table\n" "Response:
airquality$Wind"
> #ex1.13(b)
> attributes(lm.summary)
$names
 [1] "call"              "terms"             "residuals"
 [4] "coefficients"    "aliased"           "sigma"
 [7] "df"                "r.squared"       "adj.r.squared"
[10] "fstatistic"       "cov.unscaled"

$class
[1] "summary.lm"

> lm.summary$r.squared
[1] 0.2097529
> #ex1.20
> "statlog_vehicle_846x18.txt"
[1] "statlog_vehicle_846x18.txt"
> x <- read.table("statlog_vehicle_846x18.txt", header=TRUE, sep="\t")
> dim(x)
```

[1] 846   20

> head(x, 5)

	no	class	compactness	circularity	distance	radiusratio	pr.axis
1	1	0	96	55	103	201	65
2	2	0	101	56	100	215	69
3	3	0	93	35	66	154	59
4	4	0	101	48	107	222	68
5	5	0	87	38	85	177	61

	max.length	scatterratio	elongatedness	pr.axis.1	max.length.1
1	9	204	32	23	166
2	10	208	32	24	169
3	6	142	46	18	128
4	10	208	32	24	154
5	8	164	40	20	129

	scaledvmi	scaledvma	scaledradius	skewness	skewness.1	kurtosis
1	227	624	246	74	6	2
2	227	651	223	74	6	5
3	162	304	120	64	5	13
4	232	641	204	70	5	38
5	186	402	130	63	1	25

	kurtosis.1	hollows
1	186	194
2	186	193
3	197	202
4	190	202
5	198	205

> tail(x, 5)

	no	class	compactness	circularity	distance	radiusratio
842	842	3	87	45	66	139
843	843	3	95	43	76	142
844	844	3	90	44	72	157
845	845	3	89	46	84	163
846	846	3	85	36	66	123

	pr.axis	max.length	scatterratio	elongatedness	pr.axis.1
842	58	8	140	47	18

	max.length.1	scaledvmi	scaledvma	scaledradius	skewness
843	57	10	151	44	19
844	64	8	137	48	18
845	66	11	159	43	20
846	55	5	120	56	17

	max.length.1	scaledvmi	scaledvma	scaledradius	skewness
842	148	168	294	175	73
843	149	173	339	159	71
844	144	159	283	171	65
845	159	173	368	176	72
846	128	140	212	131	73

	skewness.1	kurtosis	kurtosis.1	hollows
842	3	12	188	196
843	2	23	187	200
844	9	4	196	203
845	1	20	186	197
846	1	18	186	190

```
> object.size(x)
70816 bytes
> print(object.size(x), unit = "MB" )
0.1 Mb
> #ex1.28
> "stock-data.txt"
[1] "stock-data.txt"
> y <- read.table("stock-data.txt", header = T, sep = "\t", skip = 1)
> dim(y)
[1] 60 10
> head(y, 5)
```

	半導體公司	年度	月份	最高價	最低價	加權平均價	成交筆數
1	台積電	100	1	78.3	69.6	74.30	263,999
2	台積電	100	2	77.0	69.9	72.54	235,159
3	台積電	100	3	72.2	65.7	69.74	276,434
4	台積電	100	4	73.9	68.0	71.37	211,611
5	台積電	100	5	76.9	73.0	74.96	213,185

	成交金額	成交股數	週轉率百分比
1	100,578,274,926	1,353,616,348	5.22

2	74,985,055,548	1,033,654,452	3.98
3	88,459,924,495	1,268,289,393	4.89
4	70,177,023,098	983,177,475	3.79
5	74,005,599,560	987,256,484	3.80

```
> tail(y, 5)
```

	半導體公司	年度	月份	最高價	最低價	加權平均價	成交筆數
56	旺宏	100	8	14.50	10.25	11.84	152,177
57	旺宏	100	9	12.65	10.40	11.55	108,879
58	旺宏	100	10	12.00	10.25	11.31	68,571
59	旺宏	100	11	13.65	10.85	12.54	167,018
60	旺宏	100	12	12.85	11.15	12.17	115,192

	成交金額	成交股數	週轉率百分比
56	8,137,500,167	687,167,610	20.31
57	5,542,998,380	479,779,350	14.18
58	3,041,525,834	268,710,697	7.94
59	9,538,526,797	760,264,306	22.47
60	5,070,210,532	416,455,073	12.31

```
> #ex1.33(a)
> Dates <- c("180924", "181112", "181231", "181105", "180604", "180219",
"180416", "180611", "180813", "181029")
> Time <- c("01:00", "04:00", "16:00", "23:00", "08:00", "09:00", "07:00", "17:00",
"03:00", "14:00")
> Volume <- c(7951, 159,1958, 6848, 3762, 3678, 8696, 9045, 6208, 1425)
> w <- paste(Dates, Time)
> DateTime <- as.POSIXlt(strptime(w, format = "%y%m%d %H:%M", tz = "UTC" ))
> Items <- as.factor(c("shirt", "shirt", "pants", "jacket", "jacket", "shirt", "jacket",
"jacket", "shoes", "shirt"))
> mySale <- data.frame(DateTime, Items, Volume)
> class(DateTime)
[1] "POSIXlt" "POSIXt"
> class(mySale)
[1] "data.frame"
> class(Volume)
[1] "numeric"
> class(Items)
```

```
[1] "factor"
> print(mySale)
              DateTime    Items Volume
1    2018-09-24 01:00:00   shirt    7951
2    2018-11-12 04:00:00   shirt     159
3    2018-12-31 16:00:00   pants    1958
4    2018-11-05 23:00:00  jacket    6848
5    2018-06-04 08:00:00  jacket    3762
6    2018-02-19 09:00:00   shirt    3678
7    2018-04-16 07:00:00  jacket    8696
8    2018-06-11 17:00:00  jacket    9045
9    2018-08-13 03:00:00   shoes    6208
10 2018-10-29 14:00:00   shirt    1425
> #ex1.33(b)
> Items[Dates >= "180700"]
[1] shirt   shirt   pants   jacket shoes   shirt
Levels: jacket pants shirt shoes
> sum(Volume[Dates >= "180700"], na.rm=T)
[1] 24549
>
>
```