```
> #2020/11/06 作業
>
>
> #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"         "coefficients"
 [5] "aliased"             "sigma"               "df"                  "r.squared"
 [9] "adj.r.squared" "fstatistic"       "cov.unscaled"

$class
[1] "summary.lm"

> attr(lm.summary, "names")
 [1] "call"                "terms"               "residuals"         "coefficients"
 [5] "aliased"             "sigma"               "df"                  "r.squared"
 [9] "adj.r.squared" "fstatistic"       "cov.unscaled"
> names(lm.summary)
 [1] "call"                "terms"               "residuals"         "coefficients"
```

```
 [5] "aliased"       "sigma"         "df"            "r.squared"
 [9] "adj.r.squared" "fstatistic"    "cov.unscaled"
> R <- lm.summary["r.squared"]
> class(R)
[1] "list"
> R2 <- as.numeric(R)
> class(R2)
[1] "numeric"
> R2^2
[1] 0.04399628
>
>
> #ex1.20
>
> my.data <- read.table("statlog_vehicle_846x18.txt")
> str(my.data)
'data.frame':   847 obs. of  20 variables:
 $ V1 : chr  "no" "1" "2" "3" ...
 $ V2 : chr  "class" "0" "0" "0" ...
 $ V3 : chr  "compactness" "96" "101" "93" ...
 $ V4 : chr  "circularity" "55" "56" "35" ...
 $ V5 : chr  "distance" "103" "100" "66" ...
 $ V6 : chr  "radiusratio" "201" "215" "154" ...
 $ V7 : chr  "pr.axis" "65" "69" "59" ...
 $ V8 : chr  "max.length" "9" "10" "6" ...
 $ V9 : chr  "scatterratio" "204" "208" "142" ...
 $ V10: chr  "elongatedness" "32" "32" "46" ...
 $ V11: chr  "pr.axis" "23" "24" "18" ...
 $ V12: chr  "max.length" "166" "169" "128" ...
 $ V13: chr  "scaledvmi" "227" "227" "162" ...
 $ V14: chr  "scaledvma" "624" "651" "304" ...
 $ V15: chr  "scaledradius" "246" "223" "120" ...
 $ V16: chr  "skewness" "74" "74" "64" ...
 $ V17: chr  "skewness" "6" "6" "5" ...
 $ V18: chr  "kurtosis" "2" "5" "13" ...
 $ V19: chr  "kurtosis" "186" "186" "197" ...
 $ V20: chr  "hollows" "194" "193" "202" ...
> dim(my.data)
```

```
[1] 847  20
> my.data[1:5, ]
  V1       V2          V3          V4       V5          V6       V7
1 no class compactness circularity distance radiusratio pr.axis
2  1       0          96          55       103         201      65
3  2       0         101          56       100         215      69
4  3       0          93          35        66         154      59
5  4       0         101          48       107         222      68
            V8          V9          V10      V11         V12
1 max.length scatterratio elongatedness pr.axis max.length
2          9          204          32       23         166
3         10          208          32       24         169
4          6          142          46       18         128
5         10          208          32       24         154
          V13         V14          V15      V16      V17      V18
1 scaledvmi scaledvma scaledradius skewness skewness kurtosis
2         227         624          246      74       6        2
3         227         651          223      74       6        5
4         162         304          120      64       5        13
5         232         641          204      70       5        38
         V19      V20
1 kurtosis hollows
2        186      194
3        186      193
4        197      202
5        190      202
> n <- nrow(my.data)
> p <- ncol(my.data)
> myData <- matrix(rnorm(n*p), ncol = p, nrow=n)
> print(object.size(myData), units = "Mb")
0.1 Mb
>
> #ex1.28
>
> my.data1 <- read.table("stock-data.txt", header = TRUE, skip = 1, sep="\t")
> dim(my.data1)
[1] 60 10
> my.data2[c(1:5, 56:60), ]
```

```
    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  78.30  69.60     74.30  263,999
2       台積電  100    2  77.00  69.90     72.54  235,159
3       台積電  100    3  72.20  65.70     69.74  276,434
4       台積電  100    4  73.90  68.00     71.37  211,611
5       台積電  100    5  76.90  73.00     74.96  213,185
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
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
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
> attributes(my.data1)
$names
 [1] "半導體公司"   "年度"       "月份"       "最高價"
 [5] "最低價"       "加權平均價" "成交筆數"   "成交金額"
 [9] "成交股數"     "週轉率百分比"

$class
[1] "data.frame"

$row.names
 [1]  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21
[22] 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42
[43] 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

> str(my.data1)
'data.frame':   60 obs. of  10 variables:
```

```
 $ 半導體公司   : chr   "台積電" "台積電" "台積電" "台積電" ...
 $ 年度         : int   100 100 100 100 100 100 100 100 100 100 ...
 $ 月份         : int   1 2 3 4 5 6 7 8 9 10 ...
 $ 最高價       : num   78.3 77 72.2 73.9 76.9 78.2 73.9 72.8 72.1 74 ...
 $ 最低價       : num   69.6 69.9 65.7 68 73 70.4 68.5 62.2 65.9 68.1 ...
 $ 加權平均價   : num   74.3 72.5 69.7 71.4 75 ...
 $ 成交筆數     : chr   "263,999" "235,159" "276,434" "211,611" ...
 $ 成交金額     : chr   "100,578,274,926" "74,985,055,548" "88,459,924,495"
"70,177,023,098" ...
 $ 成交股數     : chr   "1,353,616,348" "1,033,654,452" "1,268,289,393"
"983,177,475" ...
 $ 週轉率百分比: num   5.22 3.98 4.89 3.79 3.8 4.99 3.96 4.9 4.14 3.27 ...
>
>
> #ex1.33(a)
>
>
> Dates <-c ("0924", "1112", "1231", "1105", "0604", "0219", "0416", "0611", "0813",
"1029")
> Time <-c ("01:00", "04:00", "16:00", "23:00", "08:00", "09:00", "07:00", "17:00",
"03:00", "14:00")
> Items1 <-c ( "shirt", "shirt", "pants", "jacket", "jacket", "shirt", "jacket", "jacket",
"shoes", "shirt")
> Volume1 <-c ("7951", "159","1958", "6848", "3762", "3678", "8696", "9045",
"6208", "1425")
>
> DateTime1 <- paste("2018", Dates, Time)
> DateTime <- strptime(DateTime1, format="%Y %m%d %H:%M",    tz = "UTC")
> Items <- as.factor(Items1)
> Volume <- as.numeric(Volume1)
>
> mysale <- data.frame (DateTime, Items, Volume)
> 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)
> id <- 1:length(Dates)
> Q <- id [Dates >=    "0701"]
> mysale[Q, ]
                        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
9    2018-08-13 03:00:00    shoes     6208
10 2018-10-29 14:00:00    shirt     1425
>
```