```
R version 3.0.3 (2014-03-06) -- "Warm Puppy"
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Platform: x86_64-apple-darwin10.8.0 (64-bit)
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Type 'license()' or 'licence()' for distribution details.
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R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or 'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
[R.app GUI 1.63 (6660) x86_64-apple-darwin10.8.0]
[History restored from /Users/kiichi/.Rapp.history]
> x<- 4L
> X
[1] 4
> class(x)
[1] "integer"
> x<-c(4, TRUE)
> class(x)
[1] "numeric"
> X
[1] 4 1
> x <- c(1,3,5)
> y <- c(3,2,10)
> rbind(x,y)
[,1] [,2] [,3]
x 1 3 5
y 3 2 10
> class(rbind(x,y))
[1] "matrix"
> x <- (2, "a", "b", TRUE)
Error: unexpected ',' in "x <- (2,"
> x <- list(2, "a", "b", TRUE)</pre>
> X
[[1]]
[1] 2
[[2]]
[1] "a"
[[3]]
[1] "b"
[[4]]
[1] TRUE
> class(x)
[1] "list"
> x[[1]]
[1] 2
> class(x[[1]])
[1] "numeric"
> class(x[1])
[1] "list"
> x<-1:4
> y<-2:3
> X
```

```
[1] 1 2 3 4
[1] 2 3
> x+y
[1] 3 5 5 7
> x<-c(17,14,4,5,13,12,10)
[1] 17 14 4 5 13 12 10
> x[>=10]
Error: unexpected '>=' in "x[>="
> x[x>=10]
[1] 17 14 13 12 10
> x[x>=10]
[1] 17 14 13 12 10
> x[x>=10] <-4
[1] 4 4 4 5 4 4 4
> x[x>=11] <-4
> X
[1] 4 4 4 5 4 4 4
> x<-c(17,14,4,5,13,12,10)
> x[x>=11] <-4
[1] 4 4 4 5 4 4 10
> data <- read.csv("hw1_data.csv")</pre>
> data
    Ozone Solar.R Wind Temp Month Day
       41
             190 7.4
                       67
2
       36
              118 8.0
                         72
                                    2
3
       12
              149 12.6
                         74
                                5
                                    3
              313 11.5
       18
                         62
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       NA
               NA 14.3
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               NA 14.9
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              299 8.6
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               99 13.8
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9
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               19 20.1
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10
              194 8.6
       NA
                         69
                                5
                                   10
11
        7
              NA 6.9
                         74
                                   11
12
       16
              256 9.7
                         69
                                5
                                   12
              290 9.2
                                5
13
       11
                         66
                                   13
14
       14
              274 10.9
                         68
                                   14
15
       18
              65 13.2
                         58
                                5
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16
       14
              334 11.5
                         64
                                   16
              307 12.0
17
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               78 18.4
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              322 11.5
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              44 9.7
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21
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22
              320 16.6
                         73
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       4
               25 9.7
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24
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               92 12.0
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                                   24
25
               66 16.6
                         57
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                                   25
       NA
                         58
26
       NA
              266 14.9
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                                   26
27
       NA
              NA 8.0
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       23
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28
               13 12.0
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                                   28
                                5
29
       45
              252 14.9
                         81
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30
      115
              223 5.7
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                                   30
31
       37
              279 7.4
                         76
                                5
                                   31
32
       NA
              286 8.6
                         78
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33
              287 9.7
                         74
                                    2
       NA
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              242 16.1
       NA
34
                         67
                                6
                                    3
35
       NA
              186 9.2
                         84
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                                    4
36
       NΔ
              220 8.6
                         85
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37
       NA
              264 14.3
                         79
                                6
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38
       29
              127 9.7
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                         82
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39
              273 6.9
                         87
                                    8
       NA
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40
       71
              291 13.8
                         90
                                    9
41
       39
              323 11.5
                         87
                                6
                                   10
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42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 61 62 63 64 65 66 67 70 71 72 73 74 75 76 77 78 80 81 82 83 84 85 86 86 87 87 87 87 87 87 87 87 87 87 87 87 87	NA N	259 10.9 250 9.2 148 8.0 332 13.8 322 11.5 191 14.9 284 20.7 37 9.2 120 11.5 137 10.3 150 6.3 59 1.7 91 4.6 250 6.3 135 8.0 127 8.0 47 10.3 98 11.5 31 14.9 138 8.0 269 4.1 248 9.2 236 9.2 101 10.9 175 4.6 314 10.9 276 5.1 267 6.3 272 5.7 175 7.4 139 8.6 264 14.3 175 14.9 291 14.9 48 14.3 260 6.9 274 10.3 285 6.3 187 5.1 220 11.5 7 6.9 258 9.7 295 11.5 294 8.6 223 8.0 81 8.6 82 17.4 253 7.4 254 9.2 83 6.9 24 17.5	93 92 82 80 77 72 65 73 76 76 75 78 84 85 81 84 85 82 89 82 73 81 82 84 87 87 88 88 88 89 81 80 81 81 81 81 81 81 81 81 81 81 81 81 81	6 11 6 12 6 13 6 14 6 15 6 16 6 17 6 18 6 20 6 21 6 22 6 23 6 24 6 25 6 26 27 7 2 7 3 7 4 7 7 5 7 7 8 7 9 7 10 7 11 7 12 7 13 7 14 7 15 7 16 7 17 7 18 7 19 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 20 7 20 7 20 7 20 7 20 7 20 7 20
87	20	81 8.6	82	7 26
88	52	82 12.0	86	7 27
89	82	213 7.4	88	7 28
91	64	253 7.4	83	7 30
93	39	83 6.9	81	8 1
95	16	77 7.4	82	8 3
96	78	NA 6.9	86	8 4 8 5
97	35	NA 7.4	85	
98	66	NA 4.6	87	8 6
99	122	255 4.0	89	8 7
100	89	229 10.3	90	8 8
101	110	207 8.0	90	8 9
102	NA	222 8.6	92	8 10
103	NA	137 11.5	86	8 11
104	44	192 11.5	86	8 12
105	28	273 11.5	82	8 13
106	65	157 9.7	80	8 14
107	NA	64 11.5	79	8 15
108	22	71 10.3	77	8 16
109	59	51 6.3	79	8 17

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115 7.4
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             244 10.9
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             190 10.3
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              212 9.7
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117
      168
             238 3.4
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118
       73
             215 8.0
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119
       NA
             153 5.7
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             203 9.7
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121
      118
             225 2.3
                        94
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                                  29
             237 6.3
                        96
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122
       84
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             188 6.3
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             167
                  6.9
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125
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             197 5.1
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126
       73
             183 2.8
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127
       91
             189 4.6
                        93
       47
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                                   5
128
              95 7.4
                        87
129
       32
              92 15.5
                        84
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                                   6
130
       20
             252 10.9
                        80
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       23
             220 10.3
                        78
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132
       21
              230 10.9
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             259 9.7
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134
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              236 14.9
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             237 6.9
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             224 13.8
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              27 10.3
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              238 10.3
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143
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             201 8.0
                        82
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             238 12.6
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              14 9.2
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             139 10.3
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                        81
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147
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              49 10.3
                        69
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148
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              20 16.6
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             193 6.9
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149
      30
                        70
                                  26
150
      NA
             145 13.2
                        77
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151
      14
             191 14.3
                        75
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                                 28
152
      18
             131 8.0
                        76
                               9 29
             223 11.5 68
153
      20
                               9 30
> names(data)
             "Solar.R" "Wind" "Temp"
[1] "Ozone"
                                           "Month" "Day"
> data[1:2,]
Ozone Solar.R Wind Temp Month Day
1 41
2 36
           190 7.4 67
           118 8.0
                     72
> nrows(data)
Error: could not find function "nrows"
> rnum(data)
Error: could not find function "rnum"
> nrow(data)
[1] 153
> data[152,153,]
NULL
> data[152:153,]
  Ozone Solar.R Wind Temp Month Day
152 18 131 8.0 76
153 20 223 11.5 68
                               9 29
                               9 30
> data[47,"0zone"]
[1] 21
> data[47,"]
+ a
+ ;
+ ,
```

```
Error: unexpected string constant in:
....
> a
Error: object 'a' not found
> data[47,]
      Ozone Solar.R Wind Temp Month Day
47 21
                         191 14.9 77 6 16
> missing<-is.na(data[,"Ozone"])</pre>
> missing
    [1] FALSE FALSE FALSE FALSE TRUE FALSE FALSE
   [18] FALSE FALSE FALSE FALSE FALSE FALSE
                                                                                                      TRUE
                                                                                                                    TRUE
                                                                                                                                 TRUE FALSE FALSE FALSE TRUE TRUE TRUE
  [35] TRUE TRUE TRUE FALSE TRUE FALSE FALSE
                                                                                                        TRUE
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   [52] TRUE TRUE TRUE TRUE TRUE TRUE TRUE
                                                                                                      TRUE
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   [69] FALSE FALSE FALSE
                                                    TRUE FALSE FALSE
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  [86] FALSE F
[103] TRUE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE
[120] FALSE FALSE
[137] FALSE 
> length(missing)
Γ17 153
> data[missing]
Error in `[.data.frame`(data, missing) : undefined columns selected
> ozone<-data[,"0zone"]</pre>
> ozone
    [1] 41 36
                               12
                                        18
                                              NΔ
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  [26] NA NA
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  [51] 13
                      NA
                                NA
                                        NA
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[101] 110 NA
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[126] 73 91
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                                                                                                                                                                                 23
[151] 14 18 20
> ozone[is.na(ozone)]
  [35] NA NA NA
> length(ozone[is.na(ozone)])
[1] 37
> length(ozone[is.na(ozone)])
[1] 37
> ozone[!is.na(ozone)]
    [1] 41 36 12 18 28
                                                                  19
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  [51] 79 63 16
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[76] 23 31 44 21 9 45
[101] 9 13 46 18 13 24
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> mean(ozone[!is.na(ozone)])
[1] 42.12931
> data[,"Ozone'
    [1] 41 36 12 18 NA
                                                         28
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  [26] NA NA
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  [51]
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[101] 110 NA NA
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[126] 73
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                                                                                                                                                                                                                            NA
[151] 14 18 20
> data[,"Ozone"][is.na(data)]
  [35] NA NA NA NA NA NA NA NA NA
> length(data[,"Ozone"][is.na(data)])
Γ17 44
> data[,is.na(data[,"0zone"])]
Error in `[.data.frame`(data, , is.na(data[, "Ozone"])) :
    undefined columns selected
```

```
> is.na(data[,"Ozone"])
         [1] FALSE FALSE FALSE FALSE TRUE FALSE FAL
      [18] FALSE FALSE FALSE FALSE FALSE FALSE TRUE TRUE
                                                                                                                                                                                                                                                                      TRUE FALSE FALSE FALSE TRUE TRUE TRUE
                           TRUE
                                                    TRUE
                                                                               TRUE FALSE
                                                                                                                                    TRUE FALSE FALSE
                                                                                                                                                                                                                    TRUE
                                                                                                                                                                                                                                               TRUE FALSE TRUE TRUE FALSE FALSE FALSE FALSE
     [52] TRUE TRUE TRUE TRUE
                                                                                                                                   TRUE TRUE TRUE
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      [69] FALSE FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE TRUE TRUE FALSE
     [86] FALSE FALSE
 [103] TRUE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE
 [120] FALSE FALSE
[137] FALSE 
> data
                  Ozone Solar.R Wind Temp Month Day
1
                               41
                                                             190 7.4
                                                                                                           67
                               36
                                                             118 8.0
                                                                                                            72
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```

57 58 59 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 77 78 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95	NA NA NA NA NA NA 135 49 32 NA 64 40 77 97 85 NA 10 27 NA 7 48 35 61 79 63 16 NA NA 80 108 20 52 82 50 64 59 9 16	127 8.0 47 10.3 98 11.5 31 14.9 138 8.0 269 4.1 248 9.2 236 9.2 101 10.9 175 4.6 314 10.9 276 5.1 267 6.3 272 5.7 175 7.4 139 8.6 264 14.3 175 14.9 291 14.9 48 14.3 260 6.9 274 10.3 285 6.3 187 5.1 220 11.5 7 6.9 258 9.7 295 11.5 294 8.6 223 8.0 81 8.6 82 12.0 213 7.4 253 7.4 254 9.2 83 6.9 24 13.8 77 7.4	78 73 80 77 83 84 85 81 84 83 88 92 92 89 82 73 81 81 82 86 85 84 87 81 82 86 88 86 83 81 81 81	6 26 6 27 6 28 6 29 6 30 7 1 7 2 7 3 7 4 7 5 7 6 7 7 8 7 9 7 10 7 11 7 12 7 13 7 14 7 15 7 16 7 17 7 18 7 19 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 30 7 31 8 30 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 21 7 22 7 23 7 24 7 25 7 26 7 27 7 28 7 29 7 20 7 20 7 20 7 20 7 20 7 20 7 20 7 20
99	122	255 4.0	89	8 7
100	89	229 10.3	90	8 8
101	110	207 8.0	90	8 9
102	NA	222 8.6	92	8 10
103	NA	137 11.5	86	8 11
104	44	192 11.5	86	8 12
105	28	273 11.5	82	8 13
106	65	157 9.7	80	8 14
107	NA	64 11.5	79	8 15
108	22	71 10.3	77	8 16
109	59	51 6.3	79	8 17
110	23	115 7.4	76	8 18
111	31	244 10.9	78	8 19
112	44	190 10.3	78	8 20
113	21	259 15.5	77	8 21
114	9	36 14.3	72	8 22
115	NA	255 12.6	75	8 23
116	45	212 9.7	79	8 24
117	168	238 3.4	81	8 25
118	73	215 8.0	86	8 26
119	NA	153 5.7	88	8 27
120	76	203 9.7	97	8 28
121	118	225 2.3	94	8 29
122	84	237 6.3	96	8 30
123	85	188 6.3	94	8 31
124	96	167 6.9	91	9 1

```
197 5.1
125
       78
126
       73
              183 2.8
              189 4.6
                         93
                                9
                                    4
127
       91
128
       47
               95 7.4
                         87
                                9
                                    5
129
       32
               92 15.5
                         84
                                    6
                                9
130
       20
              252 10.9
                         80
                                    7
131
       23
              220 10.3
                         78
                                9
                                    8
132
       21
              230 10.9
                         75
                                9
                                    9
133
       24
              259 9.7
                         73
                                9
                                   10
134
       44
              236 14.9
                         81
                                9
                                   11
135
              259 15.5
                                9
       21
                         76
                                   12
136
       28
              238 6.3
                         77
                                9
                                   13
                                9
137
       9
               24 10.9
                         71
                                   14
                                9
138
       13
              112 11.5
                         71
                                   15
              237 6.9
139
       46
                         78
                                   16
                                9
140
       18
              224 13.8
                         67
                                   17
141
       13
               27 10.3
                         76
                                9
                                   18
142
       24
              238 10.3
                         68
                                   19
                                9
143
              201 8.0
                         82
       16
                                   20
144
       13
              238 12.6
                                9
                                   21
                         64
145
       23
               14 9.2
                         71
                                9
                                   22
146
       36
              139 10.3
                         81
                                9
                                   23
147
               49 10.3
                                9
                         69
                                   24
               20 16.6
                                9
148
                                   25
       14
                         63
149
       30
              193 6.9
                         70
                                9
                                   26
150
       NA
              145 13.2
                         77
                                9
                                   27
151
       14
              191 14.3
                         75
                                9
                                   28
152
       18
              131 8.0
                         76
                                   29
153
       20
              223 11.5
                         68
                                9
                                   30
> data[,missing]
Error in `[.data.frame`(data, , missing) : undefined columns selected
> data[missing]
Error in `[.data.frame`(data, missing) : undefined columns selected
> data[,"0zone"] > 31
  [1] TRUE TRUE FALSE FALSE
                                                                NA FALSE FALSE FALSE FALSE FALSE TRUE
                                 NA FALSE FALSE FALSE
 [18] FALSE FALSE FALSE FALSE FALSE
                                                                NA FALSE
                                                                         TRUE TRUE
                                           TRUE
                                                   NA
                                                          NA
                                                                                      TRUE
                                                                                              NA
                                                                                                           NΑ
                     NA FALSE
 Г357
        NA
              NA
                                 NA TRUE
                                           TRUE
                                                    NA
                                                          NA FALSE
                                                                      NA
                                                                            NA FALSE
                                                                                       TRUE FALSE FALSE FALSE
 [52]
         NA
               NA
                     NA
                           NA
                                 NA
                                       NA
                                              NA
                                                    NA
                                                          NA
                                                                NA
                                                                    TRUE
                                                                          TRUE
                                                                               TRUE
                                                                                         NA
                                                                                            TRUE
       TRUE
             TRUE
                   TRUE
                           NA FALSE FALSE
                                              NA FALSE TRUE
                                                              TRUE
                                                                    TRUE
                                                                          TRUE
                                                                                TRUE FALSE
                                                                                                         TRUE
 Γ69T
                                                                                              NA
                                                                                                    NA
                         TRUE
                                           TRUE TRUE FALSE FALSE
 [86]
      TRUE FALSE
                   TRUE
                              TRUE TRUE
                                                                    TRUE
                                                                          TRUE
                                                                                TRUE TRUE
                                                                                             TRUE
                                                                                                   TRUE
                                                                                                           NA
        NA TRUE FALSE
                         TRUE
                                 NA FALSE
                                           TRUE FALSE FALSE
                                                             TRUE FALSE FALSE
                                                                                  NA TRUE
[120] TRUE TRUE TRUE TRUE
                                                             TRUE FALSE FALSE FALSE TRUE FALSE FALSE
                              TRUE TRUE
                                           TRUE TRUE TRUE
[137] FALSE FALSE
                   TRUE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE
                                                                                        NA FALSE FALSE FALSE
> data[,data[,"0zone"] > 31]
Error in `[.data.frame`(data, , data[, "Ozone"] > 31) :
  undefined columns selected
> data[data[,"Ozone"] > 31,]
      Ozone Solar.R Wind Temp Month Day
1
         41
                190
                    7.4
                           67
                                  5
                                      1
2
         36
                118 8.0
                           72
                                  5
                                      2
NA
         NA
                 NA
                     NA
                           NA
                                  NA
                                     NA
NA.1
         NA
                 NA
                      NA
                           NA
                                 NA
                                     NA
                307 12.0
17
         34
                           66
                                  5
                                     17
                 92 12.0
         32
                           61
                                     24
NA.2
         NΔ
                 NΔ
                      NΔ
                           NΔ
                                 NΔ
                                     NΔ
NA.3
         NA
                 NA
                      NA
                           NA
                                 NA
                                     NA
NA.4
         NA
                 NA
                      NA
                           NA
                                  NA
                                     NA
29
         45
                252 14.9
                           81
                                  5
                                     29
30
        115
                223
                     5.7
                           79
                                  5
                                     30
                279
                           76
31
         37
                     7.4
                                  5
                                     31
NA.5
         NA
                 NA
                      NA
                           NA
                                 NA
                                     NA
NA.6
                 NA
                      \mathsf{N}\mathsf{A}
                           NA
                                  NA
                                     NA
         NA
NA.7
         NΔ
                      NΔ
                           NΔ
                                 NΔ
                                     NΔ
                 NΔ
NA.8
         NA
                 NA
                      NA
                           NA
                                  NA
                                     NA
NA.9
         NA
                 NA
                      NA
                           NA
                                 NA
                                     NA
NA.10
         NA
                 NA
                      NA
                           NΔ
                                 NA
                                     NA
NA.11
                 NA
                      NA
                           NA
                                  NA
                                     NA
40
         71
                291 13.8
                           90
                                  6
                                      9
```

41	39	323 11.5	87	6	10
NA.12	NA	NA NA	NA	NA	NA
NA.13	NA	NA NA	NA	NA	NA
NA.14	NA	NA NA	NA	NA	NA
NA.15	NA	NA NA	NA	NA	NA
48	37	284 20.7	72	6	
					17
NA.16	NA	NA NA	NA	NA	NA
NA.17	NA	NA NA	NA	NA	NA
NA.18	NA	NA NA	NA	NA	NA
NA.19	NA	NA NA	NA	NA	NA
NA.20	NA	NA NA	NA	NA	NA
NA.21	NA	NA NA	NA	NA	NA
NA.22	NA	NA NA	NA	NA	NA
NA.23	NA	NA NA	NA	NA	NA
NA.24	NA	NA NA	NA	NA	NA
NA.25	NA	NA NA	NA	NA	NA
62	135	269 4.1	84	7	1
63	49			7	2
			85		
64	32	236 9.2	81	7	3
NA.26	NA	NA NA	NA	NA	NA
66	64	175 4.6	83	7	5
67	40	314 10.9	83	7	6
68	77	276 5.1	88	7	7
69	97	267 6.3	92	7	8
70	97	272 5.7	92	7	9
71	85	175 7.4	89	7	10
NA.27	NA	NA NA	NA	NA	NA
NA.28	NA 4.0		NA 01	NA	NA 1.6
77	48	260 6.9	81	7	16
78	35	274 10.3	82	7	17
79	61	285 6.3	84	7	18
80	79	187 5.1	87	7	19
81	63	220 11.5	85	7	20
NA.29	NA	NA NA	NA	NA	NA
NA.30	NA	NA NA	NA	NA	NA
85	80	294 8.6	86	7	24
86	108	223 8.0	85	7	25
88	52	82 12.0	86	7	27
89	82	213 7.4	88	7	28
90	50		86	7	29
91	64	253 7.4	83	7	30
92	59	254 9.2	81	7	31
93	39	83 6.9	81	8	1
96	78	NA 6.9	86	8	4
97	35	NA 7.4	85	8	5
98	66	NA 4.6	87	8	6
99	122	255 4.0	89	8	7
100	89	229 10.3	90	8	8
101	110	207 8.0	90	8	9
NA.31	NA	NA NA	NA	NA	NA
NA.32	NA	NA NA	NA	NA	NA
104	44	192 11.5	86	8	12
106	65	157 9.7	80	8	14
NA.33	NA	NA NA	NA	NA	NA
109	59	51 6.3	79	8	17
112	44	190 10.3	78	8	20
NA.34	NA	NA NA	NA	NA	NA
116	45	212 9.7	79	8	24
117	168	238 3.4	81	8	25
118	73	215 8.0	86	8	26
NA.35	NA	NA NA	NA	NA	NA
120	76	203 9.7	97	8	28
121	118	225 2.3	94	8	29
122	84	237 6.3	96	8	30
123	85	188 6.3	94	8	31
124	96	167 6.9	91	9	1
125	78	197 5.1	92	9	2
126	73	183 2.8	93	9	3

```
127
                189 4.6
         91
                           93
                 95 7.4
128
                 92 15.5
129
                                   9
                                      6
         32
                           84
134
         44
                236 14.9
                           81
                                   9
                                      11
139
         46
                237 6.9
                           78
                                     16
                                   9
146
         36
                139 10.3
                           81
                                     23
NA.36
         NA
                 NA
                     NA
                           NA
                                  NA NA
> data[data[,"Ozone"] > 31 & !is.na(data[,"Ozone"]),]
    Ozone Solar.R Wind Temp Month Day
1
       41
              190 7.4
                         67
                                5
              118 8.0
2
       36
                         72
                                5
17
       34
              307 12.0
                         66
                                   17
       32
                                5
24
               92 12.0
                         61
                                    24
29
              252 14.9
                                5
                                    29
       45
                         81
30
      115
              223 5.7
                         79
                                5
                                    30
              279 7.4
                                5
31
       37
                         76
                                    31
40
       71
              291 13.8
                         90
                                 6
                                    9
41
       39
              323 11.5
                         87
                                6
                                   10
48
       37
              284 20.7
                         72
                                6
                                   17
62
      135
              269 4.1
                         84
                                7
                                     1
63
       49
              248 9.2
                         85
                                7
                                     2
                                7
64
       32
              236 9.2
                         81
                                     3
66
              175
                  4.6
                         83
                                     5
       64
67
       40
              314 10.9
                                7
                         83
                                     6
68
       77
              276 5.1
                         88
       97
                                7
                                     8
69
              267
                   6.3
                         92
70
       97
                                7
              272
                   5.7
                         92
                                     9
       85
              175
                  7.4
71
                         89
                                    10
                                7
77
       48
              260 6.9
                         81
                                    16
                                7
78
       35
              274 10.3
                         82
                                    17
              285 6.3
                                7
79
       61
                         84
                                   18
              187 5.1
80
       79
                         87
                                7
                                    19
                                 7
81
       63
              220 11.5
                         85
                                    20
                                7
85
       80
              294 8.6
                         86
                                    24
      108
                                7
86
              223 8.0
                         85
                                    25
88
       52
               82 12.0
                         86
                                 7
                                    27
              213 7.4
                                7
89
       82
                         88
                                    28
90
       50
              275 7.4
                         86
                                 7
                                    29
91
       64
              253
                   7.4
                         83
                                7
                                    30
                   9.2
92
       59
              254
                                7
                                    31
                         81
93
       39
               83
                   6.9
                                    1
                   6.9
96
       78
               NA
                         86
                                8
                                     4
97
       35
               NA
                   7.4
                         85
                                8
                                     5
               NA 4.6
98
       66
                         87
                                8
                                     6
99
                                     7
      122
              255 4.0
                         89
                                8
100
       89
              229 10.3
                         90
                                8
                                     8
101
              207 8.0
                         90
                                     9
      110
                                8
104
       44
              192 11.5
                         86
                                8
                                   12
106
       65
              157 9.7
                                8
                         80
                                    14
109
       59
               51 6.3
                         79
                                8
                                    17
112
       44
              190 10.3
                         78
                                8
                                   20
       45
              212 9.7
                                8
116
                         79
                                    24
              238 3.4
117
      168
                         81
                                8
                                    25
118
      73
              215 8.0
                         86
                                8
                                   26
                                8
120
       76
              203
                   9.7
                         97
                                   28
121
      118
              225
                   2.3
                         94
                                8
                                    29
              237
122
       84
                   6.3
                         96
                                8
                                    30
123
       85
              188
                   6.3
                         94
                                8
                                    31
124
       96
              167
                   6.9
                         91
                                9
                                     1
125
       78
              197
                   5.1
                         92
                                9
                                     2
                                9
126
       73
              183 2.8
                         93
                                     3
127
       91
              189
                   4.6
                         93
                                9
                                     4
128
       47
               95 7.4
                         87
                                9
                                     5
129
       32
               92 15.5
                         84
                                 9
                                     6
              236 14.9
                                9
134
       44
                         81
                                    11
139
              237 6.9
                                9
       46
                         78
                                   16
146
       36
              139 10.3
                        81
                                9 23
> data[data[,"Ozone"] > 31 & !is.na(data[,"Ozone"]) & data[,"Temp"]>90,]
```

```
Ozone Solar.R Wind Temp Month Day
69
          267 6.3
     97
                       7
                          9
70
          272
                  92
             5.7
120
     76
          203
             9.7
                  97
                       8
                         28
121
    118
          225
             2.3
                  94
                       8
                         29
122
     84
          237
             6.3
                  96
                       8
                         30
123
     85
          188
             6.3
                  94
                       8
                         31
124
          167
             6.9
                  91
                       9
     96
                          1
125
     78
          197
             5.1
                  92
                       9
                          2
126
     73
          183 2.8
                  93
                       9
                          3
127
     91
          189 4.6
                  93
                       9
> mean(data[data[,"0zone"] > 31 & !is.na(data[,"0zone"]) & data[,"Temp"]>90,"Solar"])
Γ17 NA
Warning message:
In mean.default(data[data[, "Ozone"] > 31 & !is.na(data[, "Ozone"]) & :
 argument is not numeric or logical: returning NA
> mean(data[data[,"Ozone"] > 31 & !is.na(data[,"Ozone"]) & data[,"Temp"]>90,"Solar.R"])
> #Extract the subset of rows of the data frame where Ozone values are above 31 and Temp values are above 90.
What is the mean of Solar.R in this subset?
> mean(data[data[,"Ozone"] > 31 & !is.na(data[,"Ozone"]) & data[,"Temp"]>90,"Solar.R"])
[1] 212.8
> mean(data[data[,"Ozone"] > 31 & !is.na(data[,"Ozone"]) & data[,"Temp"]>90 & !
is.na(data[,"Temp"]),"Solar.R"])
> mean(data[data[,"Ozone"] > 31 & !is.na(data[,"Ozone"]) & data[,"Temp"]>90 & !
is.na(data[,"Temp"]),"Solar.R"])
[1] 212.8
> mean(data[,"Temp"])
[1] 77.88235
> !is.na(data[,"Temp"])
 > !is.na(data[,"Ozone"])
 [18] TRUE TRUE TRUE
                  TRUE TRUE
                           TRUE
                               TRUE FALSE FALSE FALSE
                                                TRUF
                                                     TRUE
                                                         TRUF
                                                              TRUE FALSE FALSE FALSE
 [35] FALSE FALSE FALSE
                  TRUE FALSE
                           TRUE
                               TRUE FALSE FALSE TRUE FALSE FALSE
                                                          TRUE
                                                              TRUE TRUE
                                                                      TRUE
                                                                           TRUE
[52] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
                                                 TRUE
                                                     TRUE
                                                          TRUE FALSE
                                                                  TRUF
                                                                      TRUF
                                                                           TRUF
 [69] TRUE TRUE
             TRUE FALSE
                      TRUE
                          TRUE FALSE
                                   TRUE
                                        TRUE
                                            TRUE
                                                 TRUE
                                                     TRUE
                                                         TRUE
                                                              TRUE FALSE FALSE
                                                                           TRUE
    TRUE
         TRUE
              TRUE
                  TRUE
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                           TRUE
                               TRUE
                                    TRUE
                                        TRUE
                                            TRUE
                                                 TRUE
                                                     TRUE
                                                          TRUE
                                                              TRUE
[86]
                                                                  TRUE
                                                                       TRUE FALSE
Γ1037 FALSE
                  TRUE FALSE
                           TRUE
                                            TRUE
         TRUE
             TRUE
                               TRUE
                                   TRUE
                                        TRUE
                                                 TRUE
                                                     TRUE FALSE
                                                              TRUE
                                                                  TRUE
                                                                       TRUE FALSE
[120] TRUE TRUE
             TRUE
                  TRUE TRUE
                           TRUE
                               TRUE
                                   TRUE
                                        TRUE
                                            TRUE
                                                 TRUE
                                                     TRUE
                                                         TRUE
                                                             TRUE
                                                                  TRUE
                                                                       TRUE TRUE
    TRUE
         TRUE
             TRUE
                  TRUE
                      TRUE
                          TRUE
                               TRUE
                                   TRUE
                                       TRUE
                                            TRUE
                                                 TRUE
                                                     TRUE
                                                         TRUE FALSE
> mean(data[!is.na(data[,"Solar.R"]) & data[,"Ozone"] > 31 & !is.na(data[,"Ozone"]) & data[,"Temp"]>90 & !
is.na(data[,"Temp"]),"Solar.R"])
[1] 212.8
> data[!is.na(data[,"Temp"]) & data[,"Month"]==6,]
  Ozone Solar.R Wind Temp Month Day
32
    NΔ
         286 8.6
                 78
                      6
33
    NA
         287
             9.7
                 74
                      6
                         2
34
    NΑ
         242 16.1
                 67
                         3
                      6
35
         186 9.2
                 84
    ΝΔ
                      6
                         4
    NA
         220
             8.6
                 85
                         5
36
                      6
37
         264 14.3
                 79
    NΑ
                      6
                         6
38
    29
         127 9.7
                 82
                      6
                         7
39
         273
             6.9
                 87
                         8
    NA
40
    71
         291 13.8
                 90
                         9
                      6
41
    39
         323 11.5
                 87
                      6
                        10
42
    NA
         259 10.9
                 93
                      6
                        11
43
    NΔ
         250 9.2
                 92
                      6
                        12
         148 8.0
44
    23
                 82
                        13
45
                 80
    NA
         332 13.8
                        14
```

```
46
      NA
             322 11.5
                                6 15
             191 14.9
47
      21
                         77
                                   16
48
      37
             284 20.7
                         72
                                6
                                   17
49
      20
              37 9.2
                         65
                                6
                                    18
             120 11.5
50
      12
                         73
                                6
                                    19
51
      13
             137 10.3
                         76
                                6
                                    20
52
      NA
             150 6.3
                         77
                                6
                                    21
53
      NA
              59 1.7
                         76
                                   22
                                6
54
      NA
              91 4.6
                         76
                                6
                                    23
55
      NA
             250
                   6.3
                         76
                                6
                                    24
56
             135 8.0
                         75
                                    25
      NA
                                6
57
      NA
             127 8.0
                         78
                                6
                                    26
                         73
58
      NA
              47 10.3
                                6
                                    27
59
      NA
              98 11.5
                         80
                                6
                                    28
60
      NA
              31 14.9
                         77
                                   29
                                6
61
      NA
             138 8.0
                         83
                                6 30
> mean(data[!is.na(data[,"Temp"]) & data[,"Month"]==6,"Temp"])
[1] 79.1
> data[!is.na(data[,"Ozone"]),]
    Ozone Solar.R Wind Temp Month Day
1
       41
              190 7.4
                          67
                                      1
2
       36
              118 8.0
                          72
                                      2
3
       12
               149 12.6
                                      3
4
              313 11.5
                                      4
       18
                          62
                                  5
6
       28
               NA 14.9
                          66
                                      6
              299 8.6
7
       23
                          65
                                  5
                                      7
                                  5
8
       19
               99 13.8
                          59
                                      8
               19 20.1
                                  5
        8
                          61
                                 5
11
               NA 6.9
                          74
                                     11
                                 5
12
       16
              256 9.7
                          69
                                     12
               290 9.2
                                 5
13
       11
                          66
                                     13
14
              274 10.9
                                 5
       14
                          68
                                    14
15
       18
               65 13.2
                          58
                                  5
                                     15
16
       14
               334 11.5
                          64
                                 5
                                    16
                                 5
17
       34
              307 12.0
                          66
                                    17
18
        6
               78 18.4
                          57
                                  5
                                     18
19
              322 11.5
                                  5
       30
                          68
                                     19
20
       11
               44 9.7
                          62
                                  5
                                     20
21
                8 9.7
                          59
                                  5
        1
                                     21
              320 16.6
                          73
                                 5
22
       11
                                     22
23
        4
               25 9.7
                          61
                                 5
                                     23
24
       32
               92 12.0
                          61
                                 5
                                     24
                                 5
28
       23
               13 12.0
                          67
                                     28
               252 14.9
                                  5
29
       45
                          81
                                     29
30
      115
               223 5.7
                          79
                                  5
                                     30
31
       37
               279
                   7.4
                          76
                                  5
                                     31
38
       29
              127 9.7
                                  6
                                     7
                          82
                                     9
40
       71
               291 13.8
                          90
                                  6
41
       39
               323 11.5
                          87
                                  6
                                     10
44
       23
              148 8.0
                          82
                                 6
                                     13
47
       21
              191 14.9
                          77
                                  6
                                    16
48
       37
               284 20.7
                                  6
                          72
                                     17
               37 9.2
49
       20
                          65
                                  6
                                     18
50
       12
              120 11.5
                          73
                                  6
                                    19
              137 10.3
                                 6
51
       13
                          76
                                     20
62
      135
               269 4.1
                          84
                                      1
               248 9.2
                          85
63
       49
                                      2
64
       32
              236 9.2
                          81
                                      3
66
       64
               175 4.6
                          83
                                      5
67
       40
              314 10.9
                                  7
                                      6
                          83
       77
68
              276 5.1
                          88
                                      7
69
       97
               267
                    6.3
                          92
                                      8
70
       97
              272 5.7
                          92
                                      9
71
       85
              175 7.4
                          89
                                  7
                                     10
               264 14.3
                                  7
73
       10
                          73
                                     12
74
              175 14.9
                                  7
       27
                          81
                                     13
76
        7
               48 14.3
                          80
                                    15
77
       48
              260 6.9
                          81
                                    16
```

78 79 80 81 82 85 86 87 88 89 91 92 93 94 95 96 97 98 99 100 101 104 105 106 108 109 110 111 112 113 114 116 117 118 120 121 123 124 125 126 127 128 130 131 132 133 134 135 136 137 138 139 140 141 142 143	35 61 79 63 16 80 108 20 52 82 50 64 59 39 9 16 78 35 66 122 89 110 44 28 65 22 59 23 31 44 21 9 45 168 73 76 118 84 85 96 78 73 97 97 97 97 97 97 97 97 97 97 97 97 97	274 10.3 285 6.3 187 5.1 220 11.5 7 6.9 294 8.6 223 8.0 81 8.6 82 12.0 213 7.4 253 7.4 254 9.2 83 6.9 24 13.8 77 7.4 253 7.4 254 9.2 83 6.9 24 13.8 77 7.4 10.3 207 8.0 192 11.5 273 11.5 157 9.7 71 10.3 51 6.3 115 7.4 244 10.9 190 10.3 259 15.5 36 14.3 212 9.7 238 3.4 215 8.0 203 9.7 225 2.3 237 6.3 188 6.3 167 6.9 197 5.1 183 2.8 189 4.6 95 7.4 92 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 252 10.9 220 10.3 230 10.9 259 15.5 238 6.3 24 10.9 211.5 237 6.9 224 13.8 27 10.3 238 12.6 14 9.2 24 13.8 27 10.9 259 15.5 238 6.3 24 10.9 211.5 237 6.9 224 13.8 27 10.3 238 12.6 24 13.8 27 10.9 224 13.8 27 10.9 225 13.9 226 13.8 238 12.6 24 10.9 259 259 25.5 238 6.3 24 10.9 259 259 259 250 260 260 260 260 260 260 260 260 260 26	82 84 87 85 74 86 85 86 88 88 81 81 81 82 86 87 79 70 88 88 87 77 79 81 86 97 77 79 81 86 97 98 98 98 98 99 99 99 99 99 99 99 99 99	7 17 7 18 7 19 7 20 7 21 7 24 7 25 7 26 7 27 7 28 7 29 7 30 7 31 8 1 8 2 8 8 9 8 12 8 13 8 14 8 16 8 17 8 18 8 19 8 20 8 21 8 22 8 24 8 25 8 26 8 28 8 29 8 30 8 31 9 1 9 2 9 3 9 9 10 9 11 9 12 9 13 9 14 9 15 9 16 9 17 9 18 9 19 9 20 9 21 9 22 22 22 22 22 22 22 22 22 22 22 22 2
141 142 143 144	13 24 16 13	27 10.3 238 10.3 201 8.0 238 12.6	76 68 82 64	9 18 9 19 9 20 9 21

```
> data[!is.na(data[,"0zone"]),c("0zone","Month"]
Error: unexpected ']' in "data[!is.na(data[,"0zone"]),c("0zone","Month"]"
> data[!is.na(data[,"0zone"]),c("0zone","Month")]
     Ozone Month
1
         41
                  5
         36
2
3
         12
4
         18
                  5
6
         28
                  5
         23
                  5
         19
                  5
8
                  5
9
          8
                  5
5
11
12
         16
13
         11
                  5
                  5
14
         14
                  5
5
15
         18
16
         14
                  5
17
         34
                  5
18
          6
                  5
19
         30
20
         11
                  5
21
          1
                  5
                  5
22
         11
                  5
23
          4
                  5
5
24
         32
28
         23
                  5
5
29
         45
30
        115
31
                  5
         37
38
         29
                  6
40
         71
                  6
41
         39
                  6
44
         23
                  6
47
         21
                  6
48
         37
                  6
49
         20
                  6
50
         12
                  6
                  6
7
51
         13
62
        135
                  7
63
         49
                  7
7
64
         32
66
         64
67
         40
                  7
7
7
         77
68
         97
69
                  7
70
         97
                  7
7
7
7
71
         85
73
         10
74
         27
76
          7
77
         48
                  7
                  7
78
         35
                  7
79
         61
                  7
7
80
         79
81
         63
82
         16
                  7
7
85
         80
86
        108
         20
87
                  7
7
7
88
         52
89
         82
                  7
7
90
         50
91
         64
                  7
92
         59
93
         39
                  8
94
          9
95
                  8
```

```
78
96
97
       35
98
       66
99
      122
100
      89
101
      110
104
       44
105
       28
              8
106
       65
108
       22
              8
109
       59
              8
110
       23
111
       31
              8
112
       44
              8
113
       21
       9
114
              8
116
       45
117
      168
              8
118
       73
              8
120
       76
121
      118
              8
122
       84
123
       85
              8
124
              9
       96
125
       78
              9
126
127
              9
9
       73
       91
              9
9
128
       47
129
       32
130
       20
              9
131
       23
              9
132
       21
              9
133
       24
              9
              9
134
       44
135
       21
136
       28
              9
       9
              9
137
138
       13
139
140
              9
9
       46
       18
141
142
       24
              9
143
       16
              9
144
       13
              9
145
              9
       23
146
              9
       36
147
              9
148
       14
149
       30
              9
151
       14
              9
152
153
> data[!is.na(data[,"0zone"]) & data[,"Month"] == 5,c("0zone","Month")]
   Ozone Month
      41
      36
      12
             5
5
5
5
5
4
      18
      28
      23
8
      19
9
       8
      7
11
             5
5
5
5
5
      16
12
13
      11
14
      14
15
      18
16
      14
```

```
34
17
18
19
      30
             5
20
      11
             5
21
      1
22
      11
23
      4
             5
24
      32
             5
28
      23
             5
29
      45
30
     115
31
     37
> max(data[!is.na(data[,"Ozone"]) & data[,"Month"] == 5,"Ozone"])
[1] 115
> rbind(x, y)
  [,1] [,2] [,3] [,4] [,5] [,6] [,7]
     4 4 4
2 3 2
                         4
                              4
Warning message:
In rbind(x, y):
 number of columns of result is not a multiple of vector length (arg 2)
> x<-c(1,3,5)
> y<-c(3, 2, 10)
> rbind(x,y)
 [,1] [,2] [,3]
x 1 3 5
y 3 2 10
> m <- rbind(x,y)</pre>
> class(m)
[1] "matrix"
> x <- c(4, "a", TRUE)
> class(x)
[1] "character"
> x <- c(1,3, 5)
> y <- c(3, 2, 10)
> cbind(x,y)
    х у
[1,] 1 3
[2,] 3 2
[3,] 5 10
> class(cbind(x,y))
[1] "matrix"
> x <- list(2, "a", "b", TRUE)
> class(x[[1]])
[1] "numeric"
> x <- 1:4
> <- 2:3
Error: unexpected assignment in "<-"</pre>
> <- 2:3
Error: unexpected assignment in "<-"
> y<- 2:3
> x+y
[1] 3 5 5 7
> x <- c(17, 14, 4, 5, 13, 12, 10)
> x[x > 10] <- 4
[1] 4 4 4 5 4 4 10
> names(data)
             "Solar.R" "Wind"
[1] "Ozone"
                                  "Temp"
                                            "Month" "Day"
> data[1:2,]
  Ozone Solar.R Wind Temp Month Day
     41
           190 7.4
                       67
                              5
            118 8.0
2
     36
                      72
> nrows
Error: object 'nrows' not found
> nrow(data)
[1] 153
> data[152:153,]
```

```
Ozone Solar.R Wind Temp Month Day
      18
                      131 8.0 76
                                                       9 29
                       223 11.5
                                                       9 30
153
            20
                                          68
> data[47,"0zone"]
[1] 21
> data[,"Ozone"]
   [1] 41 36 12
                                18 NA 28
                                                     23
                                                            19
                                                                    8
                                                                         NA
                                                                                  7 16 11 14 18 14 34
                                                                                                                                  6
                                                                                                                                       30
                                                                                                                                             11
                                                                                                                                                      1 11
  Γ267 NA NA 23
                                45 115
                                             37
                                                    NA
                                                           NA
                                                                         NA NA NA
                                                                                              29
                                                                                                     NA 71 39 NA
                                                                                                                                       23
                                                                                                                                             NA NA 21 37 20
                                                                                                                                                                                 12
                                                                   NA
                                                                                                                                NA
  [51] 13 NA NA
                                NA
                                       NA
                                              NA
                                                    NA
                                                            NA
                                                                   NA
                                                                         NA NA 135
                                                                                               49
                                                                                                     32
                                                                                                            NA
                                                                                                                   64
                                                                                                                          40
                                                                                                                                 77
                                                                                                                                        97
                                                                                                                                               97
                                                                                                                                                      85
                                                                                                                                                            NA 10 27
                                                                                                                                                                                 NA
             7 48
                         35
                                61
                                       79
                                              63
                                                     16
                                                            NA
                                                                   NA
                                                                          80 108
                                                                                       20
                                                                                               52
                                                                                                     82
                                                                                                            50
                                                                                                                   64
                                                                                                                          59
                                                                                                                                 39
                                                                                                                                         9
                                                                                                                                               16
                                                                                                                                                      78
                                                                                                                                                             35
                                                                                                                                                                   66 122
                                                                                                                                                                                  89
  Γ767
                                                                                                            NA 45 168
                                                                                                      9
                                                                                                                                73
[101] 110 NA NA 44
                                       28
                                             65
                                                    NA
                                                          22
                                                                   59
                                                                         23 31
                                                                                       44
                                                                                              21
                                                                                                                                      NA
                                                                                                                                              76 118
                                                                                                                                                             84 85 96
                                                                                                                                                                                 78
[126] 73 91 47
                                32 20 23
                                                    21
                                                            24
                                                                   44
                                                                         21
                                                                                 28
                                                                                         9
                                                                                              13
                                                                                                     46 18
                                                                                                                  13 24
                                                                                                                                16
                                                                                                                                       13
                                                                                                                                               23
                                                                                                                                                    36
[151] 14 18 20
> is.na(data[,"Ozone"])
   [1] FALSE FALSE FALSE FALSE TRUE FALSE FAL
  [18] FALSE FALSE FALSE FALSE FALSE FALSE TRUE TRUE TRUE TRUE FALSE FALSE FALSE FALSE TRUE TRUE TRUE
  [35] TRUE TRUE TRUE FALSE
                                                    TRUE FALSE FALSE
                                                                                    TRUE
                                                                                              TRUE FALSE TRUE TRUE FALSE FALSE FALSE FALSE
  [52] TRUE TRUE TRUE TRUE
                                                    TRUE TRUE TRUE
                                                                                  TRUE TRUE TRUE FALSE FALSE FALSE TRUE FALSE FALSE
  [69] FALSE FALSE FALSE TRUE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE TRUE FALSE
  [86] FALSE FALSE
[103] TRUE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE
[120] FALSE FALSE
[137] FALSE TRUE FALSE FALSE FALSE
> data[is.na(data[,"Ozone"]),]
       Ozone Solar.R Wind Temp Month Day
5
            NA
                        NA 14.3
                                          56
                                                       5
                                                              5
10
            NA
                        194 8.6
                                           69
                                                       5
                                                            10
                         66 16.6
25
            NA
                                           57
                                                            25
26
            NA
                        266 14.9
                                          58
                                                       5
                                                            26
27
            NA
                         NA 8.0
                                          57
                                                       5
                                                            27
32
            NA
                        286 8.6
                                           78
                                                       6
                                                             1
33
            NΔ
                        287 9.7
                                          74
                                                       6
                                                              2
34
                        242 16.1
                                           67
                                                       6
                                                              3
            NA
35
            NA
                        186 9.2
                                           84
                                                       6
                                                              4
36
            NA
                        220 8.6
                                           85
                                                       6
                                                              5
37
                        264 14.3
            NA
                                           79
                                                       6
                                                              6
39
            NA
                        273 6.9
                                           87
                                                       6
                                                              8
42
                        259 10.9
                                           93
                                                            11
43
                        250 9.2
                                           92
                                                       6
            NA
                                                            12
45
            NΔ
                        332 13.8
                                           80
                                                       6
                                                            14
46
                        322 11.5
                                           79
                                                       6
                                                            15
52
            NΔ
                        150 6.3
                                           77
                                                      6
                                                            21
53
            NA
                         59 1.7
                                           76
                                                       6
                                                            22
54
                         91 4.6
                                           76
                                                       6
                                                            23
            NA
55
            NA
                        250 6.3
                                           76
                                                       6
                                                            24
56
            NA
                        135 8.0
                                           75
                                                       6
                                                            25
57
                        127 8.0
            NA
                                           78
                                                       6
                                                            26
58
            NA
                         47 10.3
                                          73
                                                       6
                                                            27
59
            NA
                         98 11.5
                                           80
                                                       6
                                                            28
60
            NΔ
                         31 14.9
                                          77
                                                       6
                                                            29
61
            NA
                        138 8.0
                                          83
                                                       6
                                                            30
65
            NA
                        101 10.9
                                          84
                                                       7
                                                             4
72
            NA
                        139 8.6
                                          82
                                                       7
                                                            11
                        291 14.9
75
            NA
                                                            14
                        258 9.7
                                                       7
83
            NΔ
                                           81
                                                            22
84
            NA
                        295 11.5
                                          82
                                                       7
                                                            23
102
            NA
                        222 8.6
                                           92
                                                       8
                                                            10
103
                        137 11.5
                                           86
            NΔ
                                                       8
                                                           11
107
            NA
                         64 11.5
                                           79
                                                       8
                                                            15
                        255 12.6
                                          75
115
            NA
                                                       8
                                                            23
119
            NΔ
                        153 5.7
                                          88
                                                       8
                                                           27
                                                       9
            NA
                        145 13.2
                                          77
> length(data[is.na(data[,"Ozone"]),])
> nrow(data[is.na(data[,"Ozone"]),])
[1] 37
> data[!is.na(data[,"Ozone"]),]
      Ozone Solar.R Wind Temp Month Day
```

1 2 3 4 6 7 8 9 11 12 13 14 15 16 17 18 19 20 21 22 23 24 28 29 30 31 31 34 44 46 46 46 46 47 47 47 47 47 47 47 47 47 47 47 47 47	41 36 12 18 28 23 19 8 7 16 11 14 18 14 34 6 30 11 11 4 32 23 45 115 37 29 71 39	190 7.4 118 8.0 149 12.6 313 11.5 NA 14.9 299 8.6 99 13.8 19 20.1 NA 6.9 256 9.7 290 9.2 274 10.9 65 13.2 334 11.5 307 12.0 78 18.4 322 11.5 44 9.7 8 9.7 320 16.6 25 9.7 92 12.0 13 12.0 252 14.9 223 5.7 279 7.4 127 9.7 291 13.8 323 11.5	67 72 74 62 66 65 59 61 74 69 66 68 57 68 62 59 73 61 67 81 79 76 82 90 87	5 1 5 2 5 3 5 4 5 6 5 7 5 8 5 9 5 11 5 12 5 13 5 14 5 15 5 16 5 17 5 18 5 19 5 20 5 21 5 22 5 23 5 24 5 29 5 30 6 7 7 6 9 7 7 9 7 9 7 9 7 9 7 9 7 9 7 9 7 9 8
48	37	284 20.7	72	6 17
49	20	37 9.2	65	6 18
50	12	120 11.5	73	6 19
51	13	137 10.3	76	6 20
62	135	269 4.1	84	7 1
63	49	248 9.2	85	7 2
64	32	236 9.2	81	7 3
66	64	175 4.6	83	7 5
67	40	314 10.9	83	7 6
68	77	276 5.1	88	7 7 7 8
69	97	267 6.3	92	
70	97	272 5.7	92	7 9
71	85	175 7.4	89	7 10
73	10	264 14.3	73	7 12
74	27	175 14.9	81	7 13
76	7	48 14.3	80	7 15
77	48	260 6.9	81	7 16
78	35	274 10.3	82	7 17
79	61	285 6.3	84	7 18
80	79	187 5.1	87	7 19
81	63	220 11.5	85	7 20
82	16	7 6.9	74	7 21
85	80	294 8.6	86	7 24
86	108	223 8.0	85	7 25
87	20	81 8.6	82	7 26
88	52	82 12.0	86	7 27
89	82	213 7.4	88	7 28
90	50	275 7.4	86	7 29
91	64	253 7.4	83	7 30
92	59	254 9.2	81	7 31
93	39	83 6.9	81	8 1
94	9	24 13.8	81	8 2
95	16	77 7.4	82	8 3
96	78	NA 6.9	86	8 4
97	35	NA 7.4	85	8 5
98	66	NA 4.6	87	8 6
99	122	255 4.0	89	8 7

```
100
              229 10.3
       89
                         90
                                   8
101
      110
              207 8.0
104
              192 11.5
                         86
                                8
                                   12
       44
105
       28
              273 11.5
                         82
                                8
                                   13
              157 9.7
106
       65
                         80
                                8
                                   14
               71 10.3
                                8
108
       22
                         77
                                   16
109
       59
               51 6.3
                         79
                                8
                                   17
              115 7.4
110
       23
                         76
                                8
                                   18
              244 10.9
                                8
111
       31
                         78
                                   19
112
       44
              190 10.3
                         78
                                8
                                   20
              259 15.5
113
       21
                         77
                                8
                                   21
114
       9
               36 14.3
                         72
                                8
                                   22
              212 9.7
                         79
                                8
116
       45
                                   24
              238 3.4
                         81
                                8
                                   25
117
      168
118
      73
              215 8.0
                         86
                                8
                                   26
120
      76
              203 9.7
                         97
                                8
                                   28
121
      118
              225 2.3
                         94
                                8
                                   29
122
       84
              237 6.3
                         96
                                8
                                   30
       85
                         94
                                8
123
              188 6.3
                                   31
124
       96
              167 6.9
                         91
                                9
                                    1
              197 5.1
125
       78
                         92
                                9
                                    2
                                9
                                    3
126
       73
              183 2.8
                         93
127
       91
              189 4.6
                         93
                                9
                                    4
              95 7.4
128
       47
                         87
                                9
                                    5
129
       32
               92 15.5
                         84
                                9
                                    6
              252 10.9
                                9
                                    7
130
       20
                         80
                                9
              220 10.3
                         78
                                    8
131
       23
132
              230 10.9
                         75
                                    9
       21
                                9
133
       24
              259 9.7
                         73
                                   10
              236 14.9
                                9
134
       44
                         81
                                   11
       21
              259 15.5
                                9
135
                         76
                                   12
              238 6.3
                                9
136
       28
                         77
                                   13
137
       9
               24 10.9
                         71
                                9
                                   14
                                9
138
       13
              112 11.5
                         71
                                   15
                                9
139
       46
              237 6.9
                         78
                                   16
140
       18
              224 13.8
                         67
                                9
                                   17
141
              27 10.3
                         76
                                9
       13
                                   18
142
       24
              238 10.3
                         68
                                9
                                   19
143
       16
              201 8.0
                         82
                                9
                                   20
              238 12.6
                                9
144
       13
                         64
                                   21
145
       23
              14 9.2
                         71
                                9
                                   22
                                9
146
       36
              139 10.3
                         81
                                   23
                                9
147
       7
               49 10.3
                         69
                                   24
               20 16.6
                                9
                                   25
148
       14
                         63
149
       30
                                9
              193 6.9
                         70
                                   26
151
       14
              191 14.3
                         75
                                9
                                   28
152
      18
              131 8.0
                         76
                                9
                                   29
                                9
153
       20
              223 11.5
                         68
                                   30
> data[!is.na(data[,"Ozone"]),"Ozone"]
 [1] 41 36 12 18 28 23 19
                                   8
                                        7 16 11 14 18 14 34 6 30 11
                                                                                1 11
                                                                                        4 32 23 45 115
 [26] 37 29 71 39 23 21 37 20 12 13 135 49 32 64 40 77 97 97 85 10 27
                                                                                            7
                                                                                                48 35
                                                                                                        61
 [51] 79 63 16 80 108 20 52 82 50 64 59 39 9 16 78 35 66 122 89 110 44 28 65 22 59 [76] 23 31 44 21 9 45 168 73 76 118 84 85 96 78 73 91 47 32 20 23 21 24 44 21 28
[101] 9 13 46 18 13 24 16 13 23 36
                                               7 14 30 14 18 20
> mean(data[!is.na(data[,"Ozone"]),"Ozone"])
[1] 42.12931
```