```
R version 3.0.3 (2014-03-06) -- "Warm Puppy"
Copyright (C) 2014 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin10.8.0 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

  Natural language support but running in an English locale

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)
> 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
> y
[1] 2 3
> x+y
[1] 3 5 5 7
> x<-c(17,14,4,5,13,12,10)
> x
[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
> x
[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
> x
[1]  4  4  4  5  4  4 10
> data <- read.csv("hw1_data.csv")
> data
    Ozone Solar.R Wind Temp Month Day
1      41     190  7.4   67     5   1
2      36     118  8.0   72     5   2
3      12     149 12.6   74     5   3
4      18     313 11.5   62     5   4
5      NA      NA 14.3   56     5   5
6      28      NA 14.9   66     5   6
7      23     299  8.6   65     5   7
8      19      99 13.8   59     5   8
9       8      19 20.1   61     5   9
10     NA     194  8.6   69     5  10
11      7      NA  6.9   74     5  11
12     16     256  9.7   69     5  12
13     11     290  9.2   66     5  13
14     14     274 10.9   68     5  14
15     18      65 13.2   58     5  15
16     14     334 11.5   64     5  16
17     34     307 12.0   66     5  17
18      6      78 18.4   57     5  18
19     30     322 11.5   68     5  19
20     11      44  9.7   62     5  20
21      1       8  9.7   59     5  21
22     11     320 16.6   73     5  22
23      4      25  9.7   61     5  23
24     32      92 12.0   61     5  24
25     NA      66 16.6   57     5  25
26     NA     266 14.9   58     5  26
27     NA      NA  8.0   57     5  27
28     23      13 12.0   67     5  28
29     45     252 14.9   81     5  29
30    115     223  5.7   79     5  30
31     37     279  7.4   76     5  31
32     NA     286  8.6   78     6   1
33     NA     287  9.7   74     6   2
34     NA     242 16.1   67     6   3
35     NA     186  9.2   84     6   4
36     NA     220  8.6   85     6   5
37     NA     264 14.3   79     6   6
38     29     127  9.7   82     6   7
39     NA     273  6.9   87     6   8
40     71     291 13.8   90     6   9
41     39     323 11.5   87     6  10
```

42	NA	259	10.9	93	6	11
43	NA	250	9.2	92	6	12
44	23	148	8.0	82	6	13
45	NA	332	13.8	80	6	14
46	NA	322	11.5	79	6	15
47	21	191	14.9	77	6	16
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
52	NA	150	6.3	77	6	21
53	NA	59	1.7	76	6	22
54	NA	91	4.6	76	6	23
55	NA	250	6.3	76	6	24
56	NA	135	8.0	75	6	25
57	NA	127	8.0	78	6	26
58	NA	47	10.3	73	6	27
59	NA	98	11.5	80	6	28
60	NA	31	14.9	77	6	29
61	NA	138	8.0	83	6	30
62	135	269	4.1	84	7	1
63	49	248	9.2	85	7	2
64	32	236	9.2	81	7	3
65	NA	101	10.9	84	7	4
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
72	NA	139	8.6	82	7	11
73	10	264	14.3	73	7	12
74	27	175	14.9	81	7	13
75	NA	291	14.9	91	7	14
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
83	NA	258	9.7	81	7	22
84	NA	295	11.5	82	7	23
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	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
125    78     197  5.1   92     9   2
126    73     183  2.8   93     9   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
130    20     252 10.9   80     9   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    21     259 15.5   76     9  12
136    28     238  6.3   77     9  13
137     9      24 10.9   71     9  14
138    13     112 11.5   71     9  15
139    46     237  6.9   78     9  16
140    18     224 13.8   67     9  17
141    13      27 10.3   76     9  18
142    24     238 10.3   68     9  19
143    16     201  8.0   82     9  20
144    13     238 12.6   64     9  21
145    23      14  9.2   71     9  22
146    36     139 10.3   81     9  23
147     7      49 10.3   69     9  24
148    14      20 16.6   63     9  25
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     9  29
153    20     223 11.5   68     9  30
> names(data)
[1] "Ozone"   "Solar.R" "Wind"    "Temp"    "Month"   "Day"
> data[1:2,]
  Ozone Solar.R Wind Temp Month Day
1    41     190  7.4   67     5   1
2    36     118  8.0   72     5   2
> 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     9  29
153    20     223 11.5   68     9  30
> data[47,"Ozone"]
[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"])
> missing
  [1] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
 [18] FALSE FALSE FALSE FALSE FALSE FALSE FALSE  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 FALSE
 [52]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
 [69] FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE  TRUE FALSE
 [86] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE
[103]  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
[120] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[137] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
> length(missing)
[1] 153
> data[missing]
Error in `[.data.frame`(data, missing) : undefined columns selected
> ozone<-data[,"Ozone"]
> ozone
  [1]  41  36  12  18  NA  28  23  19   8  NA   7  16  11  14  18  14  34   6  30  11   1  11   4  32  NA
 [26]  NA  NA  23  45 115  37  NA  NA  NA  NA  NA  NA  29  NA  71  39  NA  NA  23  NA  NA  21  37  20  12
 [51]  13  NA  NA  NA  NA  NA  NA  NA  NA  NA 135  49  32  NA  64  40  77  97  97  85  NA  10  27  NA
 [76]   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
[101] 110  NA  NA  44  28  65  NA  22  59  23  31  44  21   9  NA  45 168  73  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   7  14  30  NA
[151]  14  18  20
> ozone[is.na(ozone)]
 [1] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
[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  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(ozone[!is.na(ozone)])
[1] 42.12931
> 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   4  32  NA
 [26]  NA  NA  23  45 115  37  NA  NA  NA  NA  NA  NA  29  NA  71  39  NA  NA  23  NA  NA  21  37  20  12
 [51]  13  NA  NA  NA  NA  NA  NA  NA  NA  NA 135  49  32  NA  64  40  77  97  97  85  NA  10  27  NA
 [76]   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
[101] 110  NA  NA  44  28  65  NA  22  59  23  31  44  21   9  NA  45 168  73  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   7  14  30  NA
[151]  14  18  20
> data[,"Ozone"][is.na(data)]
 [1] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
[35] NA NA NA NA NA NA NA NA NA NA
> length(data[,"Ozone"][is.na(data)])
[1] 44
> data[,is.na(data["Ozone"])]
Error in `[.data.frame`(data, , is.na(data[, "Ozone"])) :
  undefined columns selected
```

```
> is.na(data["Ozone"])
  [1] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
 [18] FALSE FALSE FALSE FALSE FALSE FALSE FALSE  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 FALSE
 [52]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
 [69] FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE  TRUE FALSE
 [86] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE
[103]  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
[120] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[137] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
> data
    Ozone Solar.R Wind Temp Month Day
1      41     190  7.4   67     5   1
2      36     118  8.0   72     5   2
3      12     149 12.6   74     5   3
4      18     313 11.5   62     5   4
5      NA      NA 14.3   56     5   5
6      28      NA 14.9   66     5   6
7      23     299  8.6   65     5   7
8      19      99 13.8   59     5   8
9       8      19 20.1   61     5   9
10     NA     194  8.6   69     5  10
11      7      NA  6.9   74     5  11
12     16     256  9.7   69     5  12
13     11     290  9.2   66     5  13
14     14     274 10.9   68     5  14
15     18      65 13.2   58     5  15
16     14     334 11.5   64     5  16
17     34     307 12.0   66     5  17
18      6      78 18.4   57     5  18
19     30     322 11.5   68     5  19
20     11      44  9.7   62     5  20
21      1       8  9.7   59     5  21
22     11     320 16.6   73     5  22
23      4      25  9.7   61     5  23
24     32      92 12.0   61     5  24
25     NA      66 16.6   57     5  25
26     NA     266 14.9   58     5  26
27     NA      NA  8.0   57     5  27
28     23      13 12.0   67     5  28
29     45     252 14.9   81     5  29
30    115     223  5.7   79     5  30
31     37     279  7.4   76     5  31
32     NA     286  8.6   78     6   1
33     NA     287  9.7   74     6   2
34     NA     242 16.1   67     6   3
35     NA     186  9.2   84     6   4
36     NA     220  8.6   85     6   5
37     NA     264 14.3   79     6   6
38     29     127  9.7   82     6   7
39     NA     273  6.9   87     6   8
40     71     291 13.8   90     6   9
41     39     323 11.5   87     6  10
42     NA     259 10.9   93     6  11
43     NA     250  9.2   92     6  12
44     23     148  8.0   82     6  13
45     NA     332 13.8   80     6  14
46     NA     322 11.5   79     6  15
47     21     191 14.9   77     6  16
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
52     NA     150  6.3   77     6  21
53     NA      59  1.7   76     6  22
54     NA      91  4.6   76     6  23
55     NA     250  6.3   76     6  24
56     NA     135  8.0   75     6  25
```

57	NA	127	8.0	78	6	26
58	NA	47	10.3	73	6	27
59	NA	98	11.5	80	6	28
60	NA	31	14.9	77	6	29
61	NA	138	8.0	83	6	30
62	135	269	4.1	84	7	1
63	49	248	9.2	85	7	2
64	32	236	9.2	81	7	3
65	NA	101	10.9	84	7	4
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
72	NA	139	8.6	82	7	11
73	10	264	14.3	73	7	12
74	27	175	14.9	81	7	13
75	NA	291	14.9	91	7	14
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
83	NA	258	9.7	81	7	22
84	NA	295	11.5	82	7	23
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	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

```
125    78     197  5.1   92     9   2
126    73     183  2.8   93     9   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
130    20     252 10.9   80     9   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    21     259 15.5   76     9  12
136    28     238  6.3   77     9  13
137     9      24 10.9   71     9  14
138    13     112 11.5   71     9  15
139    46     237  6.9   78     9  16
140    18     224 13.8   67     9  17
141    13      27 10.3   76     9  18
142    24     238 10.3   68     9  19
143    16     201  8.0   82     9  20
144    13     238 12.6   64     9  21
145    23      14  9.2   71     9  22
146    36     139 10.3   81     9  23
147     7      49 10.3   69     9  24
148    14      20 16.6   63     9  25
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     9  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[,"Ozone"] > 31
  [1]  TRUE  TRUE FALSE FALSE    NA FALSE FALSE FALSE FALSE    NA FALSE FALSE FALSE FALSE FALSE FALSE  TRUE
 [18] FALSE FALSE FALSE FALSE FALSE FALSE  TRUE    NA    NA    NA FALSE  TRUE  TRUE  TRUE    NA    NA    NA
 [35]    NA    NA    NA FALSE    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
 [69]  TRUE  TRUE  TRUE    NA FALSE FALSE    NA FALSE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE    NA    NA  TRUE
 [86]  TRUE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE    NA
[103]    NA  TRUE FALSE  TRUE    NA FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE    NA  TRUE  TRUE  TRUE    NA
[120]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
[137] FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE    NA FALSE FALSE FALSE
> data[,data[,"Ozone"] > 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
17       34     307 12.0   66     5  17
24       32      92 12.0   61     5  24
NA.2     NA      NA   NA   NA    NA  NA
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
31       37     279  7.4   76     5  31
NA.5     NA      NA   NA   NA    NA  NA
NA.6     NA      NA   NA   NA    NA  NA
NA.7     NA      NA   NA   NA    NA  NA
NA.8     NA      NA   NA   NA    NA  NA
NA.9     NA      NA   NA   NA    NA  NA
NA.10    NA      NA   NA   NA    NA  NA
NA.11    NA      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	248	9.2	85	7	2
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	NA	NA	NA	NA	NA
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	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
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      91     189  4.6   93     9   4
128      47      95  7.4   87     9   5
129      32      92 15.5   84     9   6
134      44     236 14.9   81     9  11
139      46     237  6.9   78     9  16
146      36     139 10.3   81     9  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   1
2      36     118  8.0   72     5   2
17     34     307 12.0   66     5  17
24     32      92 12.0   61     5  24
29     45     252 14.9   81     5  29
30    115     223  5.7   79     5  30
31     37     279  7.4   76     5  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
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
69     97     267  6.3   92     7   8
70     97     272  5.7   92     7   9
71     85     175  7.4   89     7  10
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
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     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
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
104    44     192 11.5   86     8  12
106    65     157  9.7   80     8  14
109    59      51  6.3   79     8  17
112    44     190 10.3   78     8  20
116    45     212  9.7   79     8  24
117   168     238  3.4   81     8  25
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
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    91     189  4.6   93     9   4
128    47      95  7.4   87     9   5
129    32      92 15.5   84     9   6
134    44     236 14.9   81     9  11
139    46     237  6.9   78     9  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     97     267  6.3   92     7   8
70     97     272  5.7   92     7   9
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    91     189  4.6   93     9   4
> mean(data[data[,"Ozone"] > 31 & !is.na(data[,"Ozone"]) & data[,"Temp"]>90,"Solar"])
[1] 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"])
[1] 212.8
> #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"])
[1] 212.8
> 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"])
  [1] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
 [21] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
 [41] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
 [61] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
 [81] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
[101] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
[121] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
[141] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
> !is.na(data[,"Ozone"])
  [1]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE
 [18]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE FALSE FALSE  TRUE  TRUE  TRUE  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 FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE
 [69]  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
 [86]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE
[103] FALSE  TRUE  TRUE  TRUE FALSE  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
[137]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE
> 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    NA     286  8.6   78     6   1
33    NA     287  9.7   74     6   2
34    NA     242 16.1   67     6   3
35    NA     186  9.2   84     6   4
36    NA     220  8.6   85     6   5
37    NA     264 14.3   79     6   6
38    29     127  9.7   82     6   7
39    NA     273  6.9   87     6   8
40    71     291 13.8   90     6   9
41    39     323 11.5   87     6  10
42    NA     259 10.9   93     6  11
43    NA     250  9.2   92     6  12
44    23     148  8.0   82     6  13
45    NA     332 13.8   80     6  14
```

```
46    NA     322 11.5   79     6  15
47    21     191 14.9   77     6  16
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
52    NA     150  6.3   77     6  21
53    NA      59  1.7   76     6  22
54    NA      91  4.6   76     6  23
55    NA     250  6.3   76     6  24
56    NA     135  8.0   75     6  25
57    NA     127  8.0   78     6  26
58    NA      47 10.3   73     6  27
59    NA      98 11.5   80     6  28
60    NA      31 14.9   77     6  29
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     5   1
2      36     118  8.0   72     5   2
3      12     149 12.6   74     5   3
4      18     313 11.5   62     5   4
6      28      NA 14.9   66     5   6
7      23     299  8.6   65     5   7
8      19      99 13.8   59     5   8
9       8      19 20.1   61     5   9
11      7      NA  6.9   74     5  11
12     16     256  9.7   69     5  12
13     11     290  9.2   66     5  13
14     14     274 10.9   68     5  14
15     18      65 13.2   58     5  15
16     14     334 11.5   64     5  16
17     34     307 12.0   66     5  17
18      6      78 18.4   57     5  18
19     30     322 11.5   68     5  19
20     11      44  9.7   62     5  20
21      1       8  9.7   59     5  21
22     11     320 16.6   73     5  22
23      4      25  9.7   61     5  23
24     32      92 12.0   61     5  24
28     23      13 12.0   67     5  28
29     45     252 14.9   81     5  29
30    115     223  5.7   79     5  30
31     37     279  7.4   76     5  31
38     29     127  9.7   82     6   7
40     71     291 13.8   90     6   9
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   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
69     97     267  6.3   92     7   8
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	89	229	10.3	90	8	8
101	110	207	8.0	90	8	9
104	44	192	11.5	86	8	12
105	28	273	11.5	82	8	13
106	65	157	9.7	80	8	14
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
116	45	212	9.7	79	8	24
117	168	238	3.4	81	8	25
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
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	91	189	4.6	93	9	4
128	47	95	7.4	87	9	5
129	32	92	15.5	84	9	6
130	20	252	10.9	80	9	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	21	259	15.5	76	9	12
136	28	238	6.3	77	9	13
137	9	24	10.9	71	9	14
138	13	112	11.5	71	9	15
139	46	237	6.9	78	9	16
140	18	224	13.8	67	9	17
141	13	27	10.3	76	9	18
142	24	238	10.3	68	9	19
143	16	201	8.0	82	9	20
144	13	238	12.6	64	9	21
145	23	14	9.2	71	9	22
146	36	139	10.3	81	9	23
147	7	49	10.3	69	9	24
148	14	20	16.6	63	9	25
149	30	193	6.9	70	9	26
151	14	191	14.3	75	9	28
152	18	131	8.0	76	9	29
153	20	223	11.5	68	9	30

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

```
96     78     8
97     35     8
98     66     8
99    122     8
100    89     8
101   110     8
104    44     8
105    28     8
106    65     8
108    22     8
109    59     8
110    23     8
111    31     8
112    44     8
113    21     8
114     9     8
116    45     8
117   168     8
118    73     8
120    76     8
121   118     8
122    84     8
123    85     8
124    96     9
125    78     9
126    73     9
127    91     9
128    47     9
129    32     9
130    20     9
131    23     9
132    21     9
133    24     9
134    44     9
135    21     9
136    28     9
137     9     9
138    13     9
139    46     9
140    18     9
141    13     9
142    24     9
143    16     9
144    13     9
145    23     9
146    36     9
147     7     9
148    14     9
149    30     9
151    14     9
152    18     9
153    20     9
> data[!is.na(data[,"Ozone"]) & data[,"Month"] == 5,c("Ozone","Month")]
   Ozone Month
1     41     5
2     36     5
3     12     5
4     18     5
6     28     5
7     23     5
8     19     5
9      8     5
11     7     5
12    16     5
13    11     5
14    14     5
15    18     5
16    14     5
```

```
17    34     5
18     6     5
19    30     5
20    11     5
21     1     5
22    11     5
23     4     5
24    32     5
28    23     5
29    45     5
30   115     5
31    37     5
> max(data[!is.na(data["Ozone"]) & data["Month"] == 5,"Ozone"])
[1] 115
> rbind(x, y)
  [,1] [,2] [,3] [,4] [,5] [,6] [,7]
x    4    4    4    5    4    4   10
y    2    3    2    3    2    3    2
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)
> 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)
     x  y
[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 "<-"
> <- 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
> x
[1]  4  4  4  5  4  4 10
> names(data)
[1] "Ozone"   "Solar.R" "Wind"    "Temp"    "Month"   "Day"
> data[1:2,]
  Ozone Solar.R Wind Temp Month Day
1    41     190  7.4   67     5   1
2    36     118  8.0   72     5   2
> nrows
Error: object 'nrows' not found
> nrow(data)
[1] 153
> data[152:153,]
```

```
    Ozone Solar.R Wind Temp Month Day
152    18     131  8.0   76     9  29
153    20     223 11.5   68     9  30
> data[47,"Ozone"]
[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   4  32  NA
 [26]  NA  NA  23  45 115  37  NA  NA  NA  NA  NA  NA  29  NA  71  39  NA  NA  23  NA  NA  21  37  20  12
 [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
 [76]   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
[101] 110  NA  NA  44  28  65  NA  22  59  23  31  44  21   9  NA  45 168  73  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   7  14  30  NA
[151]  14  18  20
> is.na(data[,"Ozone"])
  [1] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
 [18] FALSE FALSE FALSE FALSE FALSE FALSE FALSE  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 FALSE
 [52]  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
 [69] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE  TRUE FALSE
 [86] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE
[103]  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
[120] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[137] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE 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
25     NA      66 16.6   57     5  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     NA     287  9.7   74     6   2
34     NA     242 16.1   67     6   3
35     NA     186  9.2   84     6   4
36     NA     220  8.6   85     6   5
37     NA     264 14.3   79     6   6
39     NA     273  6.9   87     6   8
42     NA     259 10.9   93     6  11
43     NA     250  9.2   92     6  12
45     NA     332 13.8   80     6  14
46     NA     322 11.5   79     6  15
52     NA     150  6.3   77     6  21
53     NA      59  1.7   76     6  22
54     NA      91  4.6   76     6  23
55     NA     250  6.3   76     6  24
56     NA     135  8.0   75     6  25
57     NA     127  8.0   78     6  26
58     NA      47 10.3   73     6  27
59     NA      98 11.5   80     6  28
60     NA      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
75     NA     291 14.9   91     7  14
83     NA     258  9.7   81     7  22
84     NA     295 11.5   82     7  23
102    NA     222  8.6   92     8  10
103    NA     137 11.5   86     8  11
107    NA      64 11.5   79     8  15
115    NA     255 12.6   75     8  23
119    NA     153  5.7   88     8  27
150    NA     145 13.2   77     9  27
> length(data[is.na(data[,"Ozone"]),])
[1] 6
> nrow(data[is.na(data[,"Ozone"]),])
[1] 37
> data[!is.na(data[,"Ozone"]),]
    Ozone Solar.R Wind Temp Month Day
```

1	41	190	7.4	67	5	1
2	36	118	8.0	72	5	2
3	12	149	12.6	74	5	3
4	18	313	11.5	62	5	4
6	28	NA	14.9	66	5	6
7	23	299	8.6	65	5	7
8	19	99	13.8	59	5	8
9	8	19	20.1	61	5	9
11	7	NA	6.9	74	5	11
12	16	256	9.7	69	5	12
13	11	290	9.2	66	5	13
14	14	274	10.9	68	5	14
15	18	65	13.2	58	5	15
16	14	334	11.5	64	5	16
17	34	307	12.0	66	5	17
18	6	78	18.4	57	5	18
19	30	322	11.5	68	5	19
20	11	44	9.7	62	5	20
21	1	8	9.7	59	5	21
22	11	320	16.6	73	5	22
23	4	25	9.7	61	5	23
24	32	92	12.0	61	5	24
28	23	13	12.0	67	5	28
29	45	252	14.9	81	5	29
30	115	223	5.7	79	5	30
31	37	279	7.4	76	5	31
38	29	127	9.7	82	6	7
40	71	291	13.8	90	6	9
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	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
69	97	267	6.3	92	7	8
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    89     229 10.3   90     8   8
101   110     207  8.0   90     8   9
104    44     192 11.5   86     8  12
105    28     273 11.5   82     8  13
106    65     157  9.7   80     8  14
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
116    45     212  9.7   79     8  24
117   168     238  3.4   81     8  25
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
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    91     189  4.6   93     9   4
128    47      95  7.4   87     9   5
129    32      92 15.5   84     9   6
130    20     252 10.9   80     9   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    21     259 15.5   76     9  12
136    28     238  6.3   77     9  13
137     9      24 10.9   71     9  14
138    13     112 11.5   71     9  15
139    46     237  6.9   78     9  16
140    18     224 13.8   67     9  17
141    13      27 10.3   76     9  18
142    24     238 10.3   68     9  19
143    16     201  8.0   82     9  20
144    13     238 12.6   64     9  21
145    23      14  9.2   71     9  22
146    36     139 10.3   81     9  23
147     7      49 10.3   69     9  24
148    14      20 16.6   63     9  25
149    30     193  6.9   70     9  26
151    14     191 14.3   75     9  28
152    18     131  8.0   76     9  29
153    20     223 11.5   68     9  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
>
```