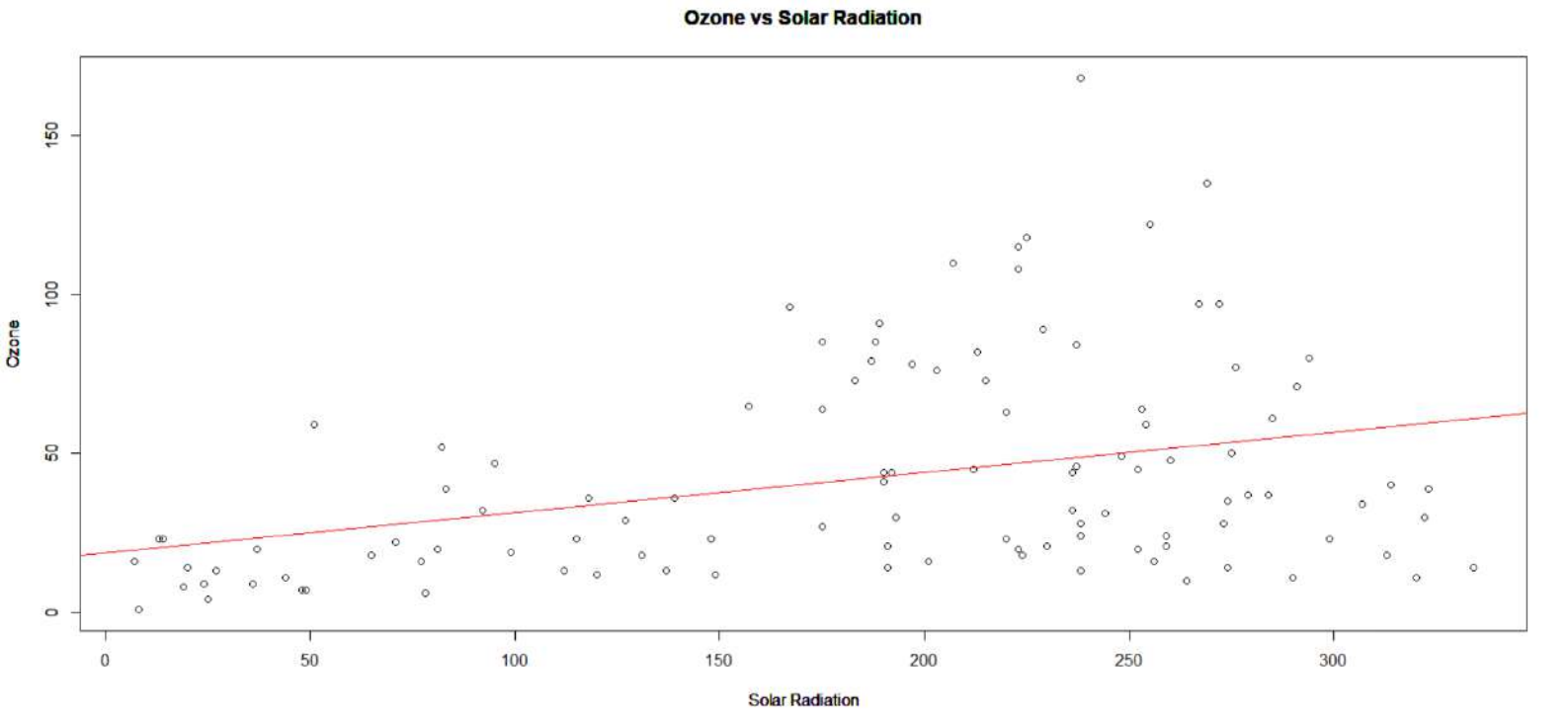
```
> # Create a vector of values
> values <- c(1, 2, 3, 4, 5, 6)
>
> # Create a vector of dimensions
> dim <- c(2, 3)  # 2 rows, 3 columns
>
> # Create an array
> array <- array(values, dim)
>
> # Assign names to each dimension
> dimnames(array) <- list(rows = c("Row1", "Row2"), columns = c("Col1", "Col2", "Col3"))
>
> # Print the array
> print(array)
     columns
rows  Col1 Col2 Col3
  Row1    1    3    5
  Row2    2    4    6
>
```

```
>
> # Create two vectors
> vec1 <- c(1, 2, 3, 4, 5, 6)
> vec2 <- c(7, 8, 9, 10, 11, 12)
>
> # Create an array
> array <- array(c(vec1, vec2), dim = c(3, 3, 2))
>
> # Print the array
> print(array)
, , 1

     [,1] [,2] [,3]
[1,]    1    4    7
[2,]    2    5    8
[3,]    3    6    9

, , 2

     [,1] [,2] [,3]
[1,]   10    1    4
[2,]   11    2    5
[3,]   12    3    6
```

RGui - [R Graphics: Device 2 (ACTIVE)]

File History Resize Windows



```
> # Create two vectors
> vec1 <- c(1, 2, 3, 4, 5, 6)
> vec2 <- c(7, 8, 9, 10, 11, 12)
>
> # Create an array
> array <- array(c(vec1, vec2), dim = c(3, 3, 2))
>
> # Print the array
> print(array)
, , 1

     [,1] [,2] [,3]
[1,]    1    4    7
[2,]    2    5    8
[3,]    3    6    9

, , 2

     [,1] [,2] [,3]
[1,]   10    1    4
[2,]   11    2    5
[3,]   12    3    6
```

```
>
> # Create three arrays
> array1 <- matrix(1:6, nrow = 2)
> array2 <- matrix(7:12, nrow = 2)
> array3 <- matrix(13:18, nrow = 2)
>
> # Combine arrays
> combined_array <- rbind(array1, array2, array3)
>
> # Print the combined array
> print(combined_array)
     [,1] [,2] [,3]
[1,]    1    3    5
[2,]    2    4    6
[3,]    7    9   11
[4,]    8   10   12
[5,]   13   15   17
[6,]   14   16   18
>
```

```
>
> # Create a vector of values
> values <- c(1:24)
>
> # Create an array
> array <- array(values, dim = c(3, 4, 2))
>
> # Print the array
> print(array)
, , 1

     [,1] [,2] [,3] [,4]
[1,]    1    4    7   10
[2,]    2    5    8   11
[3,]    3    6    9   12

, , 2

     [,1] [,2] [,3] [,4]
[1,]   13   16   19   22
[2,]   14   17   20   23
[3,]   15   18   21   24
```

```
>
> # Create a sequence of even integers greater than 50
> even_integers <- seq(52, 82, by = 2)
>
> # Create an array
> array <- matrix(even_integers, nrow = 5, ncol = 3)
Warning message:
In matrix(even_integers, nrow = 5, ncol = 3) :
  data length [16] is not a sub-multiple or multiple of the number of rows [5]
>
> # Print the array
> print(array)
     [,1] [,2] [,3]
[1,]   52   62   72
[2,]   54   64   74
[3,]   56   66   76
[4,]   58   68   78
[5,]   60   70   80
>
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
>
> # Load the airquality dataset
> data("airquality")
>
> # Check if it's a data frame
> is_dataframe <- is.data.frame(airquality)
> print(is_dataframe)
[1] TRUE
>
> # Order the data frame by the first and second columns
> ordered_data <- airquality[order(airquality[,1], airquality[,2]),]
>
> # Remove 'Solar.R' and 'Wind' variables
> cleaned_data <- ordered_data[, !(names(ordered_data) %in% c("Solar.R", "Wind"))]
>
> # Print the cleaned data
> print(cleaned_data)
    Ozone Temp Month Day
21      1   59     5  21
23      4   61     5  23
18      6   57     5  18
76      7   80     7  15
147     7   69     9  24
11      7   74     5  11
9       8   61     5   9
94      9   81     8   2
137     9   71     9  14
114     9   72     8  22
73     10   73     7  12
20     11   62     5  20
13     11   66     5  13
22     11   73     5  22
50     12   73     6  19
3      12   74     5   3
141    13   76     9  18
138    13   71     9  15
51     13   76     6  20
144    13   64     9  21
148    14   63     9  25
151    14   75     9  28
14     14   68     5  14
16     14   64     5  16
82     16   74     7  21
95     16   82     8   3
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
82    16   74    7  21
95    16   82    8   3
143   16   82    9  20
12    16   69    5  12
15    18   58    5  15
152   18   76    9  29
140   18   67    9  17
4     18   62    5   4
8     19   59    5   8
49    20   65    6  18
87    20   82    7  26
153   20   68    9  30
130   20   80    9   7
47    21   77    6  16
132   21   75    9   9
113   21   77    8  21
135   21   76    9  12
108   22   77    8  16
28    23   67    5  28
145   23   71    9  22
110   23   76    8  18
44    23   82    6  13
131   23   78    9   8
7     23   65    5   7
142   24   68    9  19
133   24   73    9  10
74    27   81    7  13
136   28   77    9  13
105   28   82    8  13
6     28   66    5   6
38    29   82    6   7
149   30   70    9  26
19    30   68    5  19
111   31   78    8  19
24    32   61    5  24
129   32   84    9   6
64    32   81    7   3
17    34   66    5  17
78    35   82    7  17
97    35   85    8   5
2     36   72    5   2
146   36   81    9  23
31    37   76    5  31
48    37   72    6  17
```

Sports headline
Liverpool Prepar...

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06-02-2025

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
31     37   76     5  31
48     37   72     6  17
93     39   81     8   1
41     39   87     6  10
67     40   83     7   6
1      41   67     5   1
112    44   78     8  20
104    44   86     8  12
134    44   81     9  11
116    45   79     8  24
29     45   81     5  29
139    46   78     9  16
128    47   87     9   5
77     48   81     7  16
63     49   85     7   2
90     50   86     7  29
88     52   86     7  27
109    59   79     8  17
92     59   81     7  31
79     61   84     7  18
81     63   85     7  20
66     64   83     7   5
91     64   83     7  30
106    65   80     8  14
98     66   87     8   6
40     71   90     6   9
126    73   93     9   3
118    73   86     8  26
120    76   97     8  28
68     77   88     7   7
125    78   92     9   2
96     78   86     8   4
80     79   87     7  19
85     80   86     7  24
89     82   88     7  28
122    84   96     8  30
71     85   89     7  10
123    85   94     8  31
100    89   90     8   8
127    91   93     9   4
124    96   91     9   1
69     97   92     7   8
70     97   92     7   9
86    108   85     7  25
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
124    96   91     9   1
69     97   92     7   8
70     97   92     7   9
86    108   85     7  25
101   110   90     8   9
30    115   79     5  30
121   118   94     8  29
99    122   89     8   7
62    135   84     7   1
117   160   81     8  25
60     NA   77     6  29
58     NA   73     6  27
53     NA   76     6  22
107    NA   79     8  15
25     NA   57     5  25
54     NA   76     6  23
59     NA   80     6  28
65     NA   84     7   4
57     NA   78     6  26
56     NA   75     6  25
103    NA   86     8  11
61     NA   83     6  30
72     NA   82     7  11
150    NA   77     9  27
52     NA   77     6  21
119    NA   88     8  27
35     NA   84     6   4
10     NA   69     5  10
36     NA   85     6   5
102    NA   92     8  10
34     NA   67     6   3
43     NA   92     6  12
55     NA   76     6  24
115    NA   75     8  23
83     NA   81     7  22
42     NA   93     6  11
37     NA   79     6   6
26     NA   58     5  26
39     NA   87     6   8
32     NA   78     6   1
33     NA   74     6   2
75     NA   91     7  14
84     NA   82     7  23
46     NA   79     6  15
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
101   110   90     8   9
30    115   79     5  30
121   118   94     8  29
99    122   89     8   7
62    135   84     7   1
117   168   81     8  25
60     NA   77     6  29
58     NA   73     6  27
53     NA   76     6  22
107    NA   79     8  15
25     NA   57     5  25
54     NA   76     6  23
59     NA   80     6  28
65     NA   84     7   4
57     NA   78     6  26
56     NA   75     6  25
103    NA   86     8  11
61     NA   83     6  30
72     NA   82     7  11
150    NA   77     9  27
52     NA   77     6  21
119    NA   88     8  27
35     NA   84     6   4
10     NA   69     5  10
36     NA   85     6   5
102    NA   92     8  10
34     NA   67     6   3
43     NA   92     6  12
55     NA   76     6  24
115    NA   75     8  23
83     NA   81     7  22
42     NA   93     6  11
37     NA   79     6   6
26     NA   58     5  26
39     NA   87     6   8
32     NA   78     6   1
33     NA   74     6   2
75     NA   91     7  14
84     NA   82     7  23
46     NA   79     6  15
45     NA   80     6  14
5      NA   56     5   5
27     NA   57     5  27
>
```

Upcoming Earnings

ENG IN

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```
>
> # Load the women dataset
> data("women")
>
> # Create a factor for height
> height_factor <- factor(women$height)
>
> # Print the factor
> print(height_factor)
 [1] 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
Levels: 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
>
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
>
> # Load the airquality dataset
> data("airquality")
>
> # (i) Compute the mean temperature (without using built-in function)
> mean_temp <- sum(airquality$Temp) / length(airquality$Temp)
> print(mean_temp)
[1] 77.88235
>
> # (ii) Extract the first five rows
> first_five_rows <- head(airquality, 5)
> print(first_five_rows)
  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
>
> # (iii) Extract all columns except Temp and Wind
> selected_columns <- airquality[, !(names(airquality) %in% c("Temp", "Wind"))]
> print(selected_columns)
    Ozone Solar.R Month Day
1      41     190     5   1
2      36     118     5   2
3      12     149     5   3
4      18     313     5   4
5      NA      NA     5   5
6      28      NA     5   6
7      23     299     5   7
8      19      99     5   8
9       8      19     5   9
10     NA     194     5  10
11      7      NA     5  11
12     16     256     5  12
13     11     290     5  13
14     14     274     5  14
15     18      65     5  15
16     14     334     5  16
17     34     307     5  17
18      6      78     5  18
19     30     322     5  19
20     11      44     5  20
21      1       8     5  21
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

20	11	44	5	20
21	1	8	5	21
22	11	320	5	22
23	4	25	5	23
24	32	92	5	24
25	NA	66	5	25
26	NA	266	5	26
27	NA	NA	5	27
28	23	13	5	28
29	45	252	5	29
30	115	223	5	30
31	37	279	5	31
32	NA	286	6	1
33	NA	287	6	2
34	NA	242	6	3
35	NA	186	6	4
36	NA	220	6	5
37	NA	264	6	6
38	29	127	6	7
39	NA	273	6	8
40	71	291	6	9
41	39	323	6	10
42	NA	259	6	11
43	NA	250	6	12
44	23	148	6	13
45	NA	332	6	14
46	NA	322	6	15
47	21	191	6	16
48	37	284	6	17
49	20	37	6	18
50	12	120	6	19
51	13	137	6	20
52	NA	150	6	21
53	NA	59	6	22
54	NA	91	6	23
55	NA	250	6	24
56	NA	135	6	25
57	NA	127	6	26
58	NA	47	6	27
59	NA	98	6	28
60	NA	31	6	29
61	NA	138	6	30
62	135	269	7	1
63	49	248	7	2

88°F Sunny

Search

ENG IN

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RGui - [R Console]

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```
62    135     269     7   1
63     49     248     7   2
64     32     236     7   3
65     NA     101     7   4
66     64     175     7   5
67     40     314     7   6
68     77     276     7   7
69     97     267     7   8
70     97     272     7   9
71     85     175     7  10
72     NA     139     7  11
73     10     264     7  12
74     27     175     7  13
75     NA     291     7  14
76      7      48     7  15
77     48     260     7  16
78     35     274     7  17
79     61     285     7  18
80     79     187     7  19
81     63     220     7  20
82     16       7     7  21
83     NA     258     7  22
84     NA     295     7  23
85     80     294     7  24
86    108     223     7  25
87     20      81     7  26
88     52      82     7  27
89     82     213     7  28
90     50     275     7  29
91     64     253     7  30
92     59     254     7  31
93     39      83     8   1
94      9      24     8   2
95     16      77     8   3
96     78      NA     8   4
97     35      NA     8   5
98     66      NA     8   6
99    122     255     8   7
100    89     229     8   8
101   110     207     8   9
102    NA     222     8  10
103    NA     137     8  11
104    44     192     8  12
105    28     273     8  13
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
106    65     157     8  14
107    NA      64     8  15
108    22      71     8  16
109    59      51     8  17
110    23     115     8  18
111    31     244     8  19
112    44     190     8  20
113    21     259     8  21
114     9      36     8  22
115    NA     255     8  23
116    45     212     8  24
117   168     238     8  25
118    73     215     8  26
119    NA     153     8  27
120    76     203     8  28
121   118     225     8  29
122    84     237     8  30
123    85     188     8  31
124    96     167     9   1
125    78     197     9   2
126    73     183     9   3
127    91     189     9   4
128    47      95     9   5
129    32      92     9   6
130    20     252     9   7
131    23     220     9   8
132    21     230     9   9
133    24     259     9  10
134    44     236     9  11
135    21     259     9  12
136    28     238     9  13
137     9      24     9  14
138    13     112     9  15
139    46     237     9  16
140    18     224     9  17
141    13      27     9  18
142    24     238     9  19
143    16     201     9  20
144    13     238     9  21
145    23      14     9  22
146    36     139     9  23
147     7      49     9  24
148    14      20     9  25
149    30     193     9  26
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
122    84     237     8  30
123    85     188     8  31
124    96     167     9   1
125    78     197     9   2
126    73     183     9   3
127    91     189     9   4
128    47      95     9   5
129    32      92     9   6
130    20     252     9   7
131    23     220     9   8
132    21     230     9   9
133    24     259     9  10
134    44     236     9  11
135    21     259     9  12
136    28     238     9  13
137     9      24     9  14
138    13     112     9  15
139    46     237     9  16
140    18     224     9  17
141    13      27     9  18
142    24     238     9  19
143    16     201     9  20
144    13     238     9  21
145    23      14     9  22
146    36     139     9  23
147     7      49     9  24
148    14      20     9  25
149    30     193     9  26
150    NA     145     9  27
151    14     191     9  28
152    18     131     9  29
153    20     223     9  30
>
> # (iv) Find the coldest day
> coldest_day <- airquality[which.min(airquality$Temp),]
> print(coldest_day)
  Ozone Solar.R Wind Temp Month Day
5    NA      NA 14.3   56     5   5
>
> # (v) Count days with wind speed greater than 17 mph
> windy_days <- sum(airquality$Wind > 17)
> print(windy_days)
[1] 3
>
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
 there is no package called 'stringi'
>
> # Load the airquality dataset
> data("airquality")
>
> # (i) Summary statistics
> summary_stats <- summary(airquality)
> print(summary_stats)
     Ozone           Solar.R          Wind             Temp           Month            Day
 Min.   :  1.00   Min.   :  7.0   Min.   : 1.700   Min.   :56.00   Min.   :5.000   Min.   : 1.0
 1st Qu.: 18.00   1st Qu.:115.8   1st Qu.: 7.400   1st Qu.:72.00   1st Qu.:6.000   1st Qu.: 8.0
 Median : 31.50   Median :205.0   Median : 9.700   Median :79.00   Median :7.000   Median :16.0
 Mean   : 42.13   Mean   :185.9   Mean   : 9.958   Mean   :77.88   Mean   :6.993   Mean   :15.8
 3rd Qu.: 63.25   3rd Qu.:258.8   3rd Qu.:11.500   3rd Qu.:85.00   3rd Qu.:8.000   3rd Qu.:23.0
 Max.   :168.00   Max.   :334.0   Max.   :20.700   Max.   :97.00   Max.   :9.000   Max.   :31.0
 NA's   :37       NA's   :7
>
> # (ii) Melt airquality data set
> melted_data <- melt(airquality)
Error in melt(airquality) : could not find function "melt"
> print(melted_data)
Error: object 'melted_data' not found
>
> # (iii) Melt with 'Month' and 'Day' as ID variables
> melted_data_with_id <- melt(airquality, id.vars = c("Month", "Day"))
Error in melt(airquality, id.vars = c("Month", "Day")) :
  could not find function "melt"
> print(melted_data_with_id)
Error: object 'melted_data_with_id' not found
>
> # (iv) Cast the molten data set with respect to month and date features
> cast_data <- dcast(melted_data_with_id, Month + Day ~ variable)
Error in dcast(melted_data_with_id, Month + Day ~ variable) :
  could not find function "dcast"
> print(cast_data)
Error: object 'cast_data' not found
>
> # (v) Compute the average of Ozone, Solar.R, Wind, and Temp per month
> monthly_avg <- dcast(melted_data_with_id, Month ~ variable, mean, na.rm = TRUE)
Error in dcast(melted_data_with_id, Month ~ variable, mean, na.rm = TRUE) :
  could not find function "dcast"
> print(monthly_avg)
Error: object 'monthly_avg' not found
>
```

RGui - [R Console]

File Edit View Misc Packages Windows Help

```
>
>
>
>
> # Load the airquality dataset
> data("airquality")
>
> # (i) Find and handle missing values
> na_counts <- colSums(is.na(airquality))
> print(na_counts)
  Ozone Solar.R    Wind    Temp   Month     Day
     37       7       0       0       0       0
> airquality <- airquality %>% mutate(across(everything(), ~replace_na(.x, mean(.x, na.rm = TRUE))))
Error in airquality %>% mutate(across(everything(), ~replace_na(.x, mean(.x,  :
  could not find function "%>%"
>
> # (ii) Apply linear regression
> lm_model <- lm(Ozone ~ Solar.R, data = airquality)
> summary(lm_model)

Call:
lm(formula = Ozone ~ Solar.R, data = airquality)

Residuals:
    Min      1Q  Median      3Q     Max
-48.292 -21.361  -8.864  16.373 119.136

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 18.59873    6.74790   2.756 0.006856 **
Solar.R      0.12717    0.03278   3.880 0.000179 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 31.33 on 109 degrees of freedom
  (42 observations deleted due to missingness)
Multiple R-squared:  0.1213,    Adjusted R-squared:  0.1133
F-statistic: 15.05 on 1 and 109 DF,  p-value: 0.0001793

>
> # (iii) Plot scatter plot and add regression line
> plot(airquality$Solar.R, airquality$Ozone, main = "Ozone vs Solar Radiation", xlab = "Solar Radiation", ylab = "Ozone")
> abline(lm_model, col = "red")
>
```