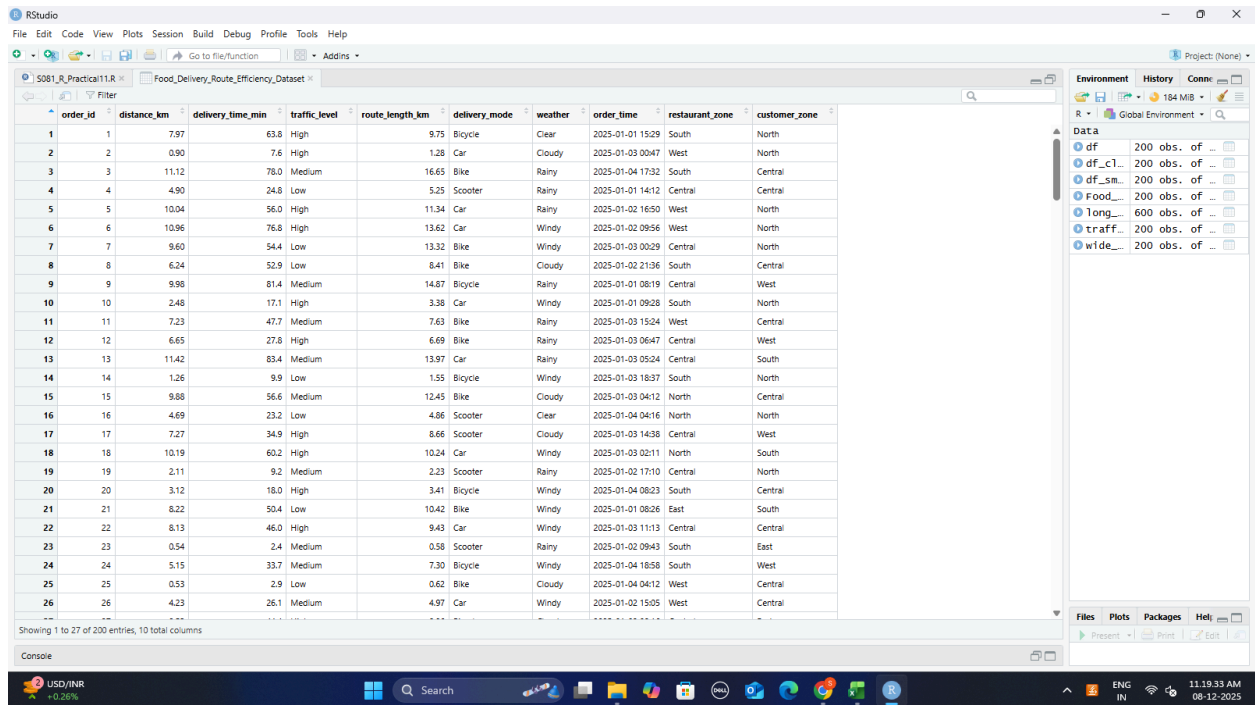
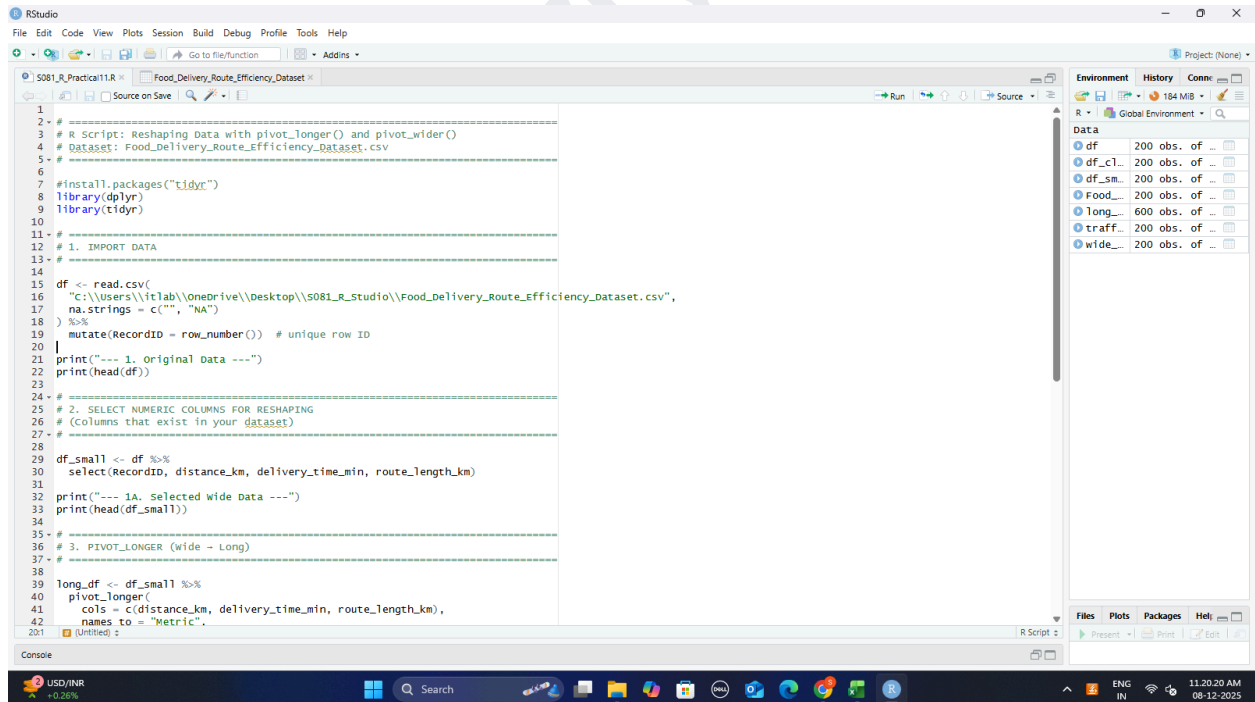


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## 11. Reshaping data using pivot\_longer() and pivot\_wider() (R).



	order_id	distance_km	delivery_time_min	traffic_level	route_length_km	delivery_mode	weather	order_time	restaurant_zone	customer_zone
1	1	7.97	63.8	High	9.75	Bicycle	Clear	2025-01-01 15:29	South	North
2	2	0.90	7.6	High	1.28	Car	Cloudy	2025-01-03 00:47	West	North
3	3	11.12	78.0	Medium	16.65	Bike	Rainy	2025-01-04 17:32	South	Central
4	4	4.90	24.8	Low	5.25	Scooter	Rainy	2025-01-01 14:12	Central	Central
5	5	10.04	56.0	High	11.34	Car	Rainy	2025-01-02 16:50	West	North
6	6	10.96	76.8	High	13.62	Car	Windy	2025-01-02 09:56	West	North
7	7	9.60	54.4	Low	13.32	Bike	Windy	2025-01-03 00:29	Central	North
8	8	6.24	52.9	Low	8.41	Bike	Cloudy	2025-01-02 21:36	South	Central
9	9	9.98	81.4	Medium	14.87	Bicycle	Rainy	2025-01-01 08:19	Central	West
10	10	2.48	17.1	High	3.38	Car	Windy	2025-01-01 09:28	South	North
11	11	7.23	47.7	Medium	7.63	Bike	Rainy	2025-01-03 15:24	West	Central
12	12	6.65	27.8	High	6.69	Bike	Rainy	2025-01-03 06:47	Central	West
13	13	11.42	83.4	Medium	13.97	Car	Rainy	2025-01-03 05:24	Central	South
14	14	1.26	9.9	Low	1.55	Bicycle	Windy	2025-01-03 18:37	South	North
15	15	9.88	56.6	Medium	12.45	Bike	Cloudy	2025-01-03 04:12	North	Central
16	16	4.69	23.2	Low	4.86	Scooter	Clear	2025-01-04 04:16	North	North
17	17	7.27	34.9	High	8.66	Scooter	Cloudy	2025-01-03 14:38	Central	West
18	18	10.19	60.2	High	10.24	Car	Windy	2025-01-03 02:11	North	South
19	19	2.11	9.2	Medium	2.23	Scooter	Rainy	2025-01-02 17:10	Central	North
20	20	3.12	18.0	High	3.41	Bicycle	Windy	2025-01-04 08:23	South	Central
21	21	8.22	50.4	Low	10.42	Bike	Windy	2025-01-01 08:26	East	South
22	22	8.13	46.0	High	9.43	Car	Windy	2025-01-03 11:13	Central	Central
23	23	0.54	2.4	Medium	0.58	Scooter	Rainy	2025-01-02 09:43	South	East
24	24	5.15	33.7	Medium	7.30	Bicycle	Windy	2025-01-04 18:58	South	West
25	25	0.53	2.9	Low	0.62	Bike	Cloudy	2025-01-04 04:12	West	Central
26	26	4.23	26.1	Medium	4.97	Car	Windy	2025-01-02 15:05	West	Central

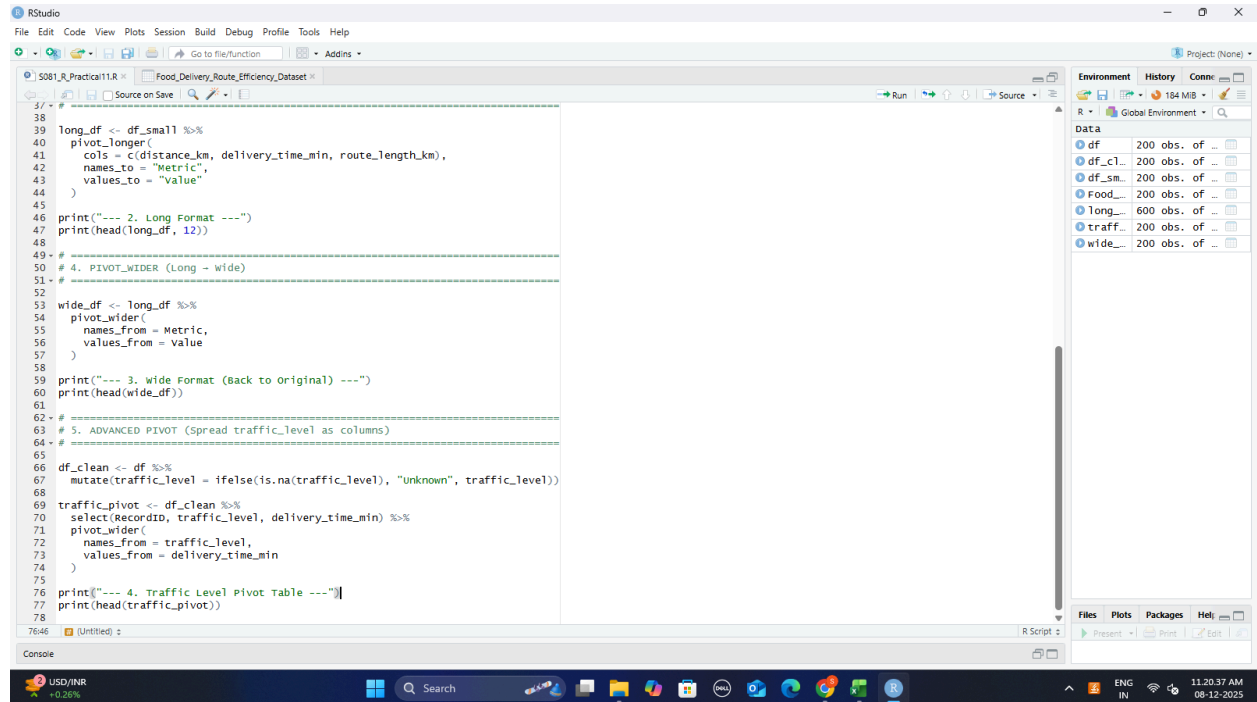


```
1
2 #
3 # R script: Reshaping data with pivot_longer() and pivot_wider()
4 # Dataset: Food_Delivery_Route_Efficiency_Dataset.csv
5 #
6
7 #install.packages("tidyr")
8 library(dplyr)
9 library(tidyr)
10
11 #
12 # 1. IMPORT DATA
13 #
14
15 df <- read.csv(
16   "c:\\Users\\itlab\\OneDrive\\Desktop\\S081_R_Studio\\Food_Delivery_Route_Efficiency_Dataset.csv",
17   na.strings = c("", "NA")
18 ) %>%
19 mutate(RecordID = row_number()) # unique row ID
20
21 print("---- 1. Original Data ----")
22 print(head(df))
23
24 #
25 # 2. SELECT NUMERIC COLUMNS FOR RESHAPING
26 # (Columns that exist in your dataset)
27 #
28
29 df_small <- df %>%
30   select(RecordID, distance_km, delivery_time_min, route_length_km)
31
32 print("---- 1A. Selected wide Data ----")
33 print(head(df_small))
34
35 #
36 # 3. PIVOT_LONGER (wide -> Long)
37 #
38
39 long_df <- df_small %>%
40   pivot_longer(
41     cols = c(distance_km, delivery_time_min, route_length_km),
42     names_to = "Metric",
43     values_to = "Value"
44   )
45
46 print("---- 3. Pivoted Long Data ----")
47 print(head(long_df))
```

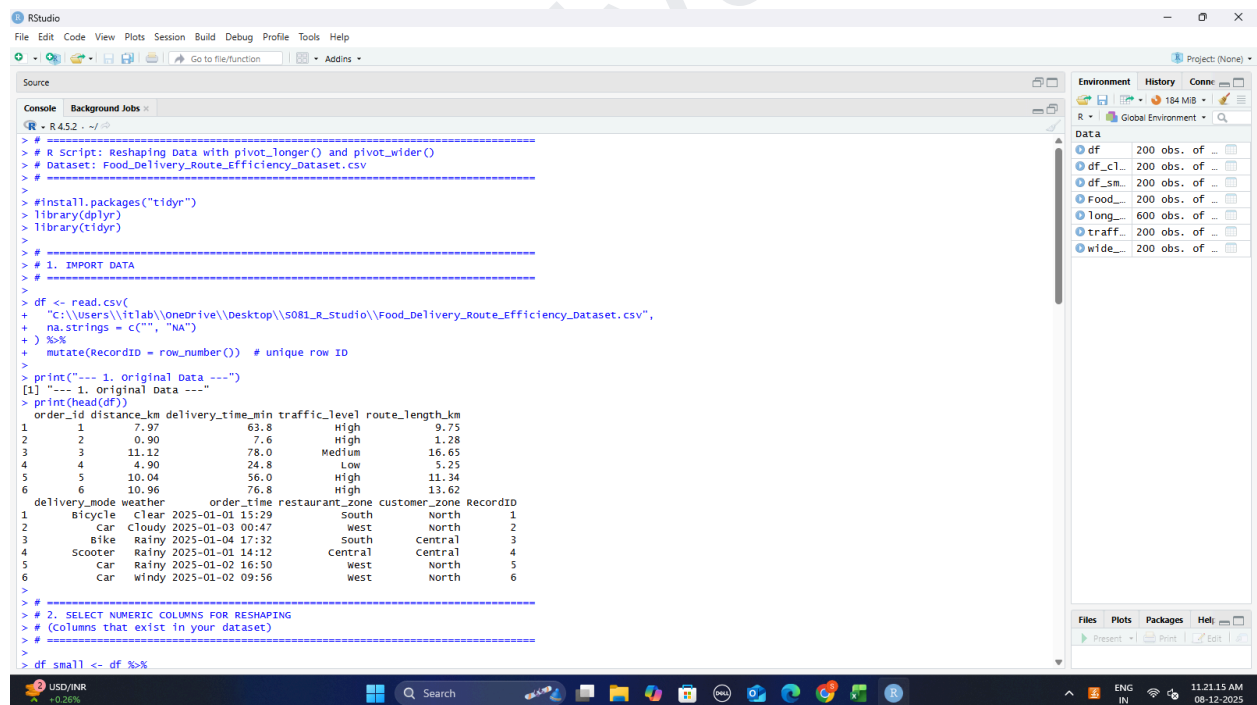
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```
37 #
38
39 long_df <- df_small %>%
40   pivot_longer(
41     cols = c(distance_km, delivery_time_min, route_length_km),
42     names_to = "Metric",
43     values_to = "value"
44   )
45
46 print("---- 2. Long Format ----")
47 print(head(long_df, 12))
48
49 # -----
50 # 4. PIVOT_WIDER (Long - wide)
51 # -----
52
53 wide_df <- long_df %>%
54   pivot_wider(
55     names_from = Metric,
56     values_from = value
57   )
58
59 print("---- 3. wide Format (Back to Original) ----")
60 print(head(wide_df))
61
62 # -----
63 # 5. ADVANCED PIVOT (Spread traffic_level as columns)
64 # -----
65
66 df_clean <- df %>%
67   mutate(traffic_level = ifelse(is.na(traffic_level), "unknown", traffic_level))
68
69 traffic_pivot <- df_clean %>%
70   select(record_id, traffic_level, delivery_time_min) %>%
71   pivot_wider(
72     names_from = traffic_level,
73     values_from = delivery_time_min
74   )
75
76 print("---- 4. Traffic Level pivot Table ----")
77 print(head(traffic_pivot))
78
```



```
> # script: reshaping data with pivot_longer() and pivot_wider()
> # Dataset: Food_Delivery_Route_Efficiency_Dataset.csv
> # -----
> # install.packages("tidyr")
> library(dplyr)
> library(tidyr)
> # -----
> # 1. IMPORT DATA
> # -----
>
> df <- read.csv(
+   "c:\\Users\\itlab\\OneDrive\\desktop\\S081_Studio\\Food_Delivery_Route_Efficiency_Dataset.csv",
+   na.strings = c("", "NA")
+ ) %>%
+   mutate(record_id = row_number()) # unique row ID
>
> print("---- 1. Original Data ----")
[1] "---- 1. Original Data ----"
> print(head(df))
  order_id distance_km delivery_time_min traffic_level route_length_km
1         1       7.97             63.8           High             9.75
2         2       0.90              7.6           High             1.28
3         3      11.12             78.0        Medium            16.65
4         4       4.90             24.8           Low              5.25
5         5      10.04             56.0           High            11.34
6         6      10.96             76.8           High            13.62
 delivery_mode weather  order_time restaurant_zone customer_zone RecordID
1    bicycle    clear 2025-01-01 15:29             South           North         1
2         car  cloudy 2025-01-03 00:47             west            North         2
3         bike  rainy 2025-01-04 17:32             South           Central         3
4    scooter  rainy 2025-01-01 14:12             central          Central         4
5         car  rainy 2025-01-02 16:50             west            North         5
6         car  windy 2025-01-02 09:56             west            North         6
>
> # -----
> # 2. SELECT NUMERIC COLUMNS FOR RESHAPING
> # (columns that exist in your dataset)
> # -----
> df_small <- df %>%
```

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```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Background Jobs
R - R452 - ~/
> # 2. SELECT NUMERIC COLUMNS FOR RESHAPING
> # (columns that exist in your dataset)
> #
> df_small <- df %>%
+   select(RecordID, distance_km, delivery_time_min, route_length_km)
>
> print("--- 1A. Selected wide data ---")
[1] "--- 1A. Selected wide data ---"
> print(head(df_small))
  RecordID distance_km delivery_time_min route_length_km
1         1         7.97             63.8             9.75
2         2         0.90              7.6             1.28
3         3        11.12             78.0            16.65
4         4         4.90             24.8             5.25
5         5        10.04             56.0            11.34
6         6        10.96             76.8            13.62
>
> #
> # 3. PIVOT_LONGER (wide -> Long)
> #
> long_df <- df_small %>%
+   pivot_longer(
+     cols = c(distance_km, delivery_time_min, route_length_km),
+     names_to = "Metric",
+     values_to = "Value"
+   )
>
> print("--- 2. Long Format ---")
[1] "--- 2. Long Format ---"
> print(head(long_df, 12))
# A tibble: 12 x 3
  RecordID Metric      Value
  <int> <chr> <dbl>
1     1 distance_km    7.97
2     1 delivery_time_min 63.8
3     1 route_length_km  9.75
4     2 distance_km    0.9
5     2 delivery_time_min  7.6
6     2 route_length_km 11.8
7     3 distance_km   11.1
8     3 delivery_time_min 78.0
9     3 route_length_km 16.6
10    4 distance_km    4.9
11    4 delivery_time_min 24.8
12    4 route_length_km  5.25
>
> #
> # 4. PIVOT_WIDER (Long -> wide)
> #
> wide_df <- long_df %>%
+   pivot_wider(
+     names_from = Metric,
+     values_from = Value
+   )
>
> print("--- 3. Wide Format (back to original) ---")
[1] "--- 3. Wide Format (back to original) ---"
> print(head(wide_df))
# A tibble: 6 x 4
  RecordID distance_km delivery_time_min route_length_km
  <int> <dbl> <dbl> <dbl>
1     1    7.97    63.8    9.75
2     2    0.9     7.6     1.28
3     3   11.1    78.0    16.6
4     4    4.9    24.8     5.25
5     5   10.0    56.0    11.3
6     6   10.9    76.8    13.6
>
> #
> # 5. ADVANCED PIVOT (spread traffic_level as columns)
> #
> df_clean <- df %>%
+   mutate(traffic_level = ifelse(is.na(traffic_level), "unknown", traffic_level))
>
> traffic_pivot <- df_clean %>%
+   select(RecordID, traffic_level, delivery_time_min) %>%
+   pivot_wider(
+     names_from = traffic_level,
+     values_from = delivery_time_min
+   )
>
> print("--- 4. Traffic Level Pivot Table ---")
```

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Background Jobs
R - R452 - ~/
0      3 route_length_km    16.6
10     4 distance_km       4.9
11     4 delivery_time_min 24.8
12     4 route_length_km    5.25
>
> #
> # 4. PIVOT_WIDER (Long -> wide)
> #
> wide_df <- long_df %>%
+   pivot_wider(
+     names_from = Metric,
+     values_from = Value
+   )
>
> print("--- 3. Wide Format (back to original) ---")
[1] "--- 3. Wide Format (back to original) ---"
> print(head(wide_df))
# A tibble: 6 x 4
  RecordID distance_km delivery_time_min route_length_km
  <int> <dbl> <dbl> <dbl>
1     1    7.97    63.8    9.75
2     2    0.9     7.6     1.28
3     3   11.1    78.0    16.6
4     4    4.9    24.8     5.25
5     5   10.0    56.0    11.3
6     6   10.9    76.8    13.6
>
> #
> # 5. ADVANCED PIVOT (spread traffic_level as columns)
> #
> df_clean <- df %>%
+   mutate(traffic_level = ifelse(is.na(traffic_level), "unknown", traffic_level))
>
> traffic_pivot <- df_clean %>%
+   select(RecordID, traffic_level, delivery_time_min) %>%
+   pivot_wider(
+     names_from = traffic_level,
+     values_from = delivery_time_min
+   )
>
> print("--- 4. Traffic Level Pivot Table ---")
```

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```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function Addins
Source
Console Background Jobs
R - R 4.5.2 - ~/
> print("--- 3. Wide Format (back to original) ---")
[1] "--- 3. Wide Format (back to original) ---"
> print(head(wide_df))
# A tibble: 6 x 4
  RecordID distance_km delivery_time_min route_length_km
  <int>      <dbl>      <dbl>      <dbl>
1     1         7.97         63.8         9.75
2     2         0.9         7.6         1.28
3     3        11.1         78         16.6
4     4         4.9         24.8         5.25
5     5        10.0         56         11.3
6     6        11.0         76.8         13.6
>
> # =====
> # 5. ADVANCED PIVOT (spread traffic_level as columns)
> # =====
>
> df_clean <- df %>%
+   mutate(traffic_level = ifelse(is.na(traffic_level), "Unknown", traffic_level))
>
> traffic_pivot <- df_clean %>%
+   select(RecordID, traffic_level, delivery_time_min) %>%
+   pivot_wider(
+     names_from = traffic_level,
+     values_from = delivery_time_min
+   )
>
> print("--- 4. Traffic Level Pivot Table ---")
[1] "--- 4. Traffic Level Pivot Table ---"
> print(head(traffic_pivot))
# A tibble: 6 x 4
  RecordID High Medium Low
  <int>      <dbl>      <dbl> <dbl>
1     1     63.8    NA    NA
2     2     7.6    NA    NA
3     3     NA     78    NA
4     4     NA     NA    24.8
5     5     56    NA    NA
6     6    76.8    NA    NA
>
> Food_Delivery_Route_Efficiency_Dataset <- read_csv("C:/Users/itlab/OneDrive/Desktop/S081_R_Studio/Food_Delivery_Route_Efficiency_Dataset.csv")
> view(Food_Delivery_Route_Efficiency_Dataset)
> |
```

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