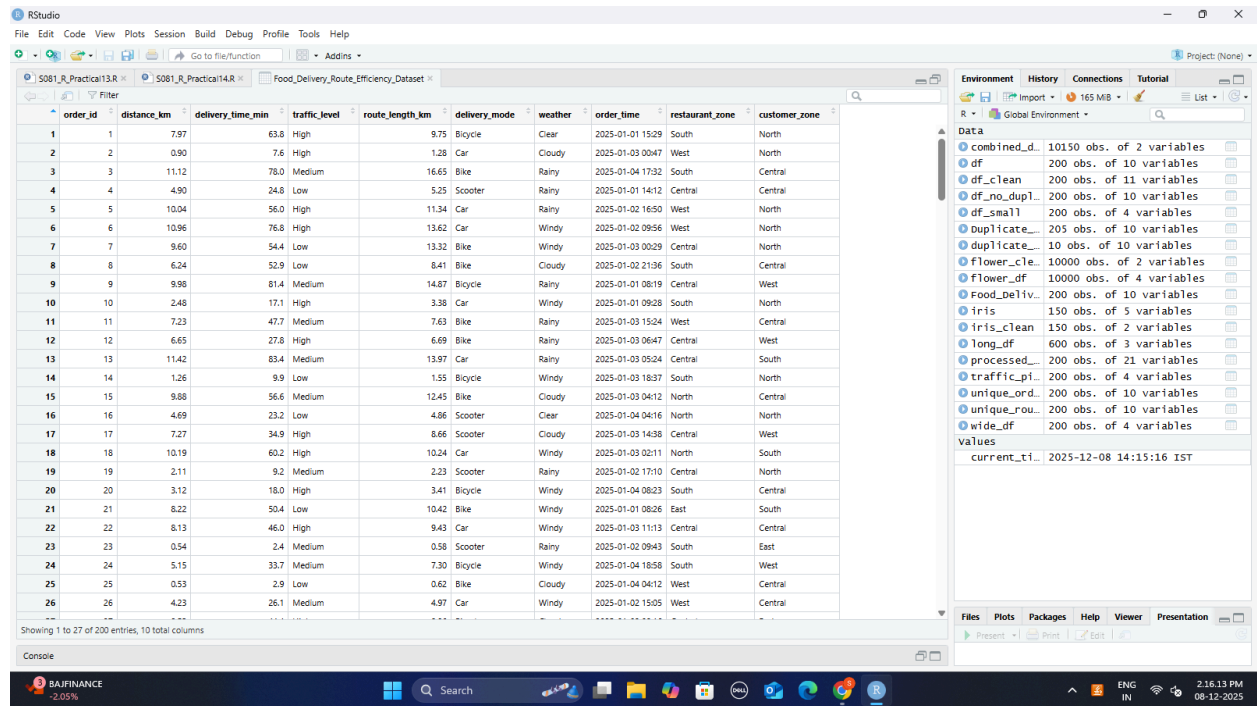


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14. Extracting date components using lubridate:: functions (R).



The screenshot displays the RStudio interface. The main window shows a data frame with columns: order_id, distance_km, delivery_time_min, traffic_level, route_length_km, delivery_mode, weather, order_time, restaurant_zone, and customer_zone. The data is sorted by order_id. The Environment pane on the right lists various objects, including 'combined_d...', 'df', 'df_clean', 'df_no_dupl...', 'df_small', 'duplicate...', 'flower_cle...', 'flower_df', 'Food_Deliv...', 'iris', 'iris_clean', 'long_df', 'processed...', 'traffic_pi...', 'unique_ord...', 'unique_rou...', and 'wide_df'. The console at the bottom shows the command 'current_t1...' and the output '2025-12-08 14:15:16 IST'.

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

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```
1 # R script: Extracting Date & Time Components using lubridate
2 # Dataset: Food_Delivery_Route_Efficiency_Dataset.csv
3
4
5
6 # Install if needed
7 install.packages("lubridate")
8
9 library(lubridate)
10 library(dplyr)
11
12 # =====
13 # 1. IMPORT FOOD DELIVERY DATA
14 # =====
15
16 df <- read.csv(
17   "C:\\Users\\l1tab\\OneDrive\\Desktop\\S081_R_Studio\\Food_Delivery_Route_Efficiency_Dataset.csv",
18   na.strings = c("", "NA")
19 )
20
21 print("---- Original Dataset Preview ----")
22 print(head(df))
23
24 # =====
25 # 2. PARSE DATE-TIME (order_time) AND EXTRACT COMPONENTS
26 # =====
27
28 processed_data <- df %>%
29   mutate(
30     # Convert character -> POSIX date-time
31     Actual_DateTime = ymd_hm(order_time),
32
33     # Extract Components
34     Year = year(Actual_DateTime),
35     Month_Number = month(Actual_DateTime),
36     Month_Name = month(Actual_DateTime, label = TRUE),
37
38     Day = day(Actual_DateTime),
39     weekday_number = wday(Actual_DateTime),
40     weekday_Name = wday(Actual_DateTime, label = TRUE, abbr = FALSE),
41
42     Hour = hour(Actual_DateTime).
43   )
44
45 print("---- Extracted Date-Time Components ----")
46 print(head(processed_data))
47
48 # =====
49 # 3. SYSTEM DATE-TIME EXTRACTION (NOW)
50 # =====
51
52 current_time <- now()
53
54 print("---- Current Time Extraction ----")
55 print(paste("Current Year:", year(current_time)))
56 print(paste("Current Month:", month(current_time)))
57 print(paste("Current Day:", day(current_time)))
58 print(paste("Current Hour:", hour(current_time)))
59 print(paste("Current Minute:", minute(current_time)))
60
```

```
24 # =====
25 # 2. PARSE DATE-TIME (order_time) AND EXTRACT COMPONENTS
26 # =====
27
28 processed_data <- df %>%
29   mutate(
30     # Convert character -> POSIX date-time
31     Actual_DateTime = ymd_hm(order_time),
32
33     # Extract Components
34     Year = year(Actual_DateTime),
35     Month_Number = month(Actual_DateTime),
36     Month_Name = month(Actual_DateTime, label = TRUE),
37
38     Day = day(Actual_DateTime),
39     weekday_number = wday(Actual_DateTime),
40     weekday_Name = wday(Actual_DateTime, label = TRUE, abbr = FALSE),
41
42     Hour = hour(Actual_DateTime),
43     Minute = minute(Actual_DateTime),
44
45     Quarter = quarter(Actual_DateTime),
46     Day_of_Year = yday(Actual_DateTime)
47   )
48
49 print("---- Extracted Date-Time Components ----")
50 print(head(processed_data))
51
52 # =====
53 # 3. SYSTEM DATE-TIME EXTRACTION (NOW)
54 # =====
55
56 current_time <- now()
57
58 print("---- Current Time Extraction ----")
59 print(paste("Current Year:", year(current_time)))
60 print(paste("Current Month:", month(current_time)))
61 print(paste("Current Day:", day(current_time)))
62 print(paste("Current Hour:", hour(current_time)))
63 print(paste("Current Minute:", minute(current_time)))
64
65
```

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The screenshot shows the RStudio interface with the following content:

```
R - R4.5.2 - ~/
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Background Jobs
> # =====
> # R Script: Extracting date & Time Components using lubridate
> # Dataset: Food_Delivery_Route_Efficiency_Dataset.csv
> # =====
> #
> # Install if needed
> install.packages("lubridate")

WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:
https://cran.rstudio.com/bin/windows/rtools/
Installing package into 'C:/Users/itlab/AppData/Local/R/win-library/4.5'
(as 'lib' is unspecified)

also installing the dependency 'timechange'
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/timechange_0.3.0.zip'
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/lubridate_1.9.4.zip'
package 'timechange' successfully unpacked and MD5 sums checked
package 'lubridate' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
C:/Users/itlab/AppData/Local/Temp/RtmpgzM7/downloaded_packages

> library(lubridate)

Attaching package: 'lubridate'

The following objects are masked from 'package:base':
date, intersect, setdiff, union

> library(dplyr)

Attaching package: 'dplyr'

The following objects are masked from 'package:stats':
filter, lag
```

The Environment pane on the right lists the following data objects:

Object	Size
combined_d...	10150 obs. of 2 variables
df	200 obs. of 11 variables
df_clean	200 obs. of 11 variables
df_no_dupl...	200 obs. of 11 variables
df_small	200 obs. of 4 variables
Duplicate...	205 obs. of 10 variables
duplicate...	10 obs. of 10 variables
flower_cle...	10000 obs. of 2 variables
flower_df	10000 obs. of 4 variables
Food_Deliv...	200 obs. of 10 variables
iris	150 obs. of 5 variables
iris_clean	150 obs. of 5 variables
long_df	600 obs. of 3 variables
processed...	200 obs. of 21 variables
traffic_pi...	200 obs. of 4 variables
unique_ord...	200 obs. of 10 variables
unique_rou...	200 obs. of 10 variables
wide_df	200 obs. of 4 variables

The screenshot shows the RStudio interface with the following content:

```
R - R4.5.2 - ~/
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Background Jobs
> # =====
> # The following objects are masked from package:base:
> # intersect, setdiff, setequal, union
> # =====
> #
> # 1. IMPORT FOOD DELIVERY DATA
> # =====
> df <- read.csv(
+   "C:/Users/itlab/OneDrive/Desktop/S081_R_Studio/Food_Delivery_Route_Efficiency_Dataset.csv",
+   na.strings = c("", "NA")
+ )
> print("--- Original Dataset Preview ---")
> 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
1    Bicycle    clear 2025-01-01 15:29             South          North
2         Car    Cloudy 2025-01-03 00:47             West          North
3         Bike   Rainy 2025-01-04 17:32             South          Central
4    Scooter   Rainy 2025-01-01 14:12             Central          Central
5         Car   Rainy 2025-01-02 16:50             West          North
6         Car   Windy 2025-01-02 09:56             West          North
> # =====
> # 2. PARSE DATE-TIME (order_time) AND EXTRACT COMPONENTS
> # =====
> #
> processed_data <- df %>%
+   mutate(
+     # Convert character to POSIX date-time
+     Actual_datetime = ymd_hm(order_time),
+     # Extract components
+     Year = year(Actual_datetime),
+     ...
+   )
```

The Environment pane on the right lists the following data objects:

Object	Size
combined_d...	10150 obs. of 2 variables
df	200 obs. of 11 variables
df_clean	200 obs. of 11 variables
df_no_dupl...	200 obs. of 11 variables
df_small	200 obs. of 4 variables
Duplicate...	205 obs. of 10 variables
duplicate...	10 obs. of 10 variables
flower_cle...	10000 obs. of 2 variables
flower_df	10000 obs. of 4 variables
Food_Deliv...	200 obs. of 10 variables
iris	150 obs. of 5 variables
iris_clean	150 obs. of 5 variables
long_df	600 obs. of 3 variables
processed...	200 obs. of 21 variables
traffic_pi...	200 obs. of 4 variables
unique_ord...	200 obs. of 10 variables
unique_rou...	200 obs. of 10 variables
wide_df	200 obs. of 4 variables

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```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Background Jobs
R - R452 - ~/...
+ Minute = minute(Actual_DateTime),
+ Quarter = quarter(Actual_DateTime),
+ Day_of_Year = yday(Actual_DateTime)
+ )
> print("--- Extracted Date-Time Components ---")
[1] "--- Extracted Date-Time Components ---"
> print(head(processed_data))
  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
1    bicycle    clear 2025-01-01 15:29          South         North
2         car    cloudy 2025-01-03 00:47           west         North
3         bike    rainy 2025-01-04 17:32          South         Central
4    scooter    rainy 2025-01-01 14:12          Central         Central
5         car    rainy 2025-01-02 16:50           west         North
6         car    windy 2025-01-02 09:56           west         North
  Actual_DateTime Year Month_Number Month_Name Day weekday_Number
1 2025-01-01 15:29:00 2025         1         Jan 1         4
2 2025-01-03 00:47:00 2025         1         Jan 3         6
3 2025-01-04 17:32:00 2025         1         Jan 4         7
4 2025-01-01 14:12:00 2025         1         Jan 1         4
5 2025-01-02 16:50:00 2025         1         Jan 2         5
6 2025-01-02 09:56:00 2025         1         Jan 2         5
  weekday_Name Hour Minute Quarter Day_of_Year
1    wednesday    15     29         1         1
2      Friday      0     47         1         3
3    Saturday    17     32         1         4
4    wednesday    14     12         1         1
5    Thursday    16     50         1         2
6    Thursday      9     56         1         2
> # =====
> # =====
> # 3. SYSTEM DATE-TIME EXTRACTION (NOW)
> # =====
> # =====
```

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Background Jobs
R - R452 - ~/...
  delivery_mode weather order_time restaurant_zone customer_zone
1    bicycle    clear 2025-01-01 15:29          South         North
2         car    cloudy 2025-01-03 00:47           west         North
3         bike    rainy 2025-01-04 17:32          South         Central
4    scooter    rainy 2025-01-01 14:12          Central         Central
5         car    rainy 2025-01-02 16:50           west         North
6         car    windy 2025-01-02 09:56           west         North
  Actual_DateTime Year Month_Number Month_Name Day weekday_Number
1 2025-01-01 15:29:00 2025         1         Jan 1         4
2 2025-01-03 00:47:00 2025         1         Jan 3         6
3 2025-01-04 17:32:00 2025         1         Jan 4         7
4 2025-01-01 14:12:00 2025         1         Jan 1         4
5 2025-01-02 16:50:00 2025         1         Jan 2         5
6 2025-01-02 09:56:00 2025         1         Jan 2         5
  weekday_Name Hour Minute Quarter Day_of_Year
1    wednesday    15     29         1         1
2      Friday      0     47         1         3
3    Saturday    17     32         1         4
4    wednesday    14     12         1         1
5    Thursday    16     50         1         2
6    Thursday      9     56         1         2
> # =====
> # =====
> # 3. SYSTEM DATE-TIME EXTRACTION (NOW)
> # =====
> # =====
> current_time <- now()
>
> print("--- Current Time Extraction ---")
[1] "--- Current Time Extraction ---"
> print(paste("Current Year:", year(current_time)))
[1] "Current Year: 2025"
> print(paste("Current Month:", month(current_time)))
[1] "Current Month: 12"
> print(paste("Current Day:", day(current_time)))
[1] "Current Day: 8"
> print(paste("Current Hour:", hour(current_time)))
[1] "Current Hour: 14"
> print(paste("Current Minute:", minute(current_time)))
[1] "Current Minute: 15"
>
```

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Roll no. :- S081