

Lab task 3:

The screenshot shows the RStudio interface with the following details:

- File**: File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Help.
- Run**: Go to Reference, Run, Source on Save.
- Console**: Displays R code and its output. The code includes loading packages, reading datasets, and creating a scatterplot matrix. It shows an error for the 'airs' dataset and successful execution for the 'iris' dataset.
- Plots**: A scatterplot matrix titled "Scatterplot Matrix of Iris Data" is displayed. The diagonal shows histograms of Sepal.Length, Sepal.Width, Petal.Length, and Petal.Width. The off-diagonal shows scatterplots between pairs of these variables.
- Environment**: Shows the global environment with objects like 'iris', 'sepal.length', 'sepal.width', 'petal.length', 'petal.width', 'sum_sq', 'sum_sqrd', 'sum_sqrd_arr', 'sum_sqrd_diag', 'x', 'y', 'add_numbers', 'calculate_stats', 'df', 'grade_result', 'greet', 'is_even', and 'multiply'.
- Help**: Project (None).

Lab task 4:

The figure shows a dual-monitor setup. The left monitor displays the RStudio interface with an R script for data cleaning and scaling, and a terminal window showing the execution of the script. The right monitor displays a ggcorrplot heatmap titled 'carb'.

R Script:

```
library(dplyr)
library(ggcorrplot)

# Load mtcars dataset
mtcars_clean <- na.omit(mtcars)
cat("Total NA values after cleaning:", sum(is.na(mtcars_clean)), "\n")
install.packages("dplyr")
library(dplyr)

# Clean mtcars
mtcars_clean <- mtcars_clean[!duplicated(mtcars_clean), ]
mtcars_filtered <- mtcars_clean %>% filter(mpg > 20)
mtcars_selected <- mtcars_filtered %>% select(mpg, hp, wt)
mtcars_mutated <- mtcars_selected %>%
  mutate(power_to_weight = hp / wt)
mtcars_scaled <- mtcars_selected %>%
  mutate(across(c(mpg, hp, wt), - scale(.[, 1])))
head(mtcars_scaled)
```

Terminal:

```
R - R 4.5.1 - /Users/.../Desktop/22-40582-3lab4.R
> library(dplyr)
> mtcars_clean <- na.omit(mtcars)
> cat("Total NA values after cleaning:", sum(is.na(mtcars_clean)), "\n")
Total NA values after cleaning: 0
> install.packages("dplyr")
> library(dplyr)

> # Clean mtcars
> mtcars_clean <- mtcars[selected, ]
> mtcars_clean <- mtcars_clean[!duplicated(mtcars_clean), ]
> mtcars_clean <- mtcars_clean %>% filter(mpg > 20)
> head(mtcars_clean)
```

ggcorrplot Heatmap:

	carb	gear	am	vs	qsec	wt	drat	hp	disp	cyl	mpg
carb	1.0	0.3	0.1	-0.6	-0.7	-0.6	0.4	0.4	-0.9	0.9	-0.8
gear	0.3	1.0	-0.1	-0.2	-0.2	-0.7	0.1	0.4	0.7	0.7	-0.9
am	0.1	0.8	1.0	-0.1	-0.2	-0.6	0.7	0.7	-0.7	0.7	-0.8
vs	-0.6	-0.2	-0.2	1.0	-0.2	-0.7	-0.7	-0.2	-0.6	-0.5	-0.6
qsec	-0.7	-0.2	-0.7	-0.2	1.0	-0.7	-0.7	-0.2	-0.7	-0.5	-0.7
wt	-0.6	-0.7	-0.6	-0.4	-0.7	1.0	-0.7	-0.7	-0.7	-0.5	-0.7
drat	-0.7	0.1	0.4	0.7	-0.7	-0.7	1.0	-0.7	-0.7	-0.5	-0.7
hp	0.4	-0.7	-0.7	-0.7	-0.2	-0.7	-0.7	1.0	-0.7	-0.5	-0.7
disp	-0.8	-0.7	0.9	-0.4	-0.7	-0.6	-0.6	-0.7	1.0	-0.5	-0.7
cyl	0.9	0.8	-0.7	-0.8	-0.6	-0.8	-0.5	-0.5	-0.5	1.0	-0.6
mpg	-0.9	-0.8	-0.8	0.7	-0.9	0.4	0.7	0.6	0.5	-0.5	1.0

Lab 5:

The screenshot shows the RStudio interface. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Help, and Help. Below the menu is a toolbar with icons for Source, Save, Run, and Source. The main workspace contains a script editor with the following R code:

```
22 html_elements('.c11-title-metadata-item:nth-child(1)').%>%  
23 html_text()%>%  
24 # Extract the ratings  
25 # The selector finds the span containing the rating value  
26 rating <- webpage %>%  
27 html_elements('.ipc-rating-star--rating') %>%  
28 html_text()%>%  
29 # Create a data frame  
30 movies_df <- data.frame(  
31   Rank = 1:25,  
32   Title = titles,  
33   Year = as.integer(years), # Convert year to a number  
34   Rating = as.numeric(ratings) # Convert rating to a number  
35 )  
36 # Display the first few rows of the data frame  
37 head(movies_df)
```

The environment browser on the right lists global variables:

- movies_df: 25 obs. of 4 variables
- mtcars: 32 obs. of 11 variables
- mtcars_clean: 32 obs. of 11 variables
- mtcars_filtered: 14 obs. of 11 variables

A correlation heatmap is displayed below the environment browser, showing correlations between variables carb, gear, am, vs, qsec, wt, drat, hp, disp, cyl, and mpp. The color scale ranges from -1.0 (blue) to 1.0 (red).