BASICS / PROJECT MANAGEMENT

Installing packages
install.packages("package_name")

Loading packages
library(package_name)

Creating a project with prodigenr
prodigenr::setup_project("~/Path/ProjName")

Blank slate
usethis::use_blank_slate()

Creating a new R script in R folder
usethis::use_r("filename")

Sourcing a script in another script
source(here::here("R/package-loading.R"))

Assigning value to variable
variable_name <- 100

Creating vectors
```
c("a", "b", "c")          # character vector
c(TRUE, FALSE, FALSE)     # logical vector
c(1, 5, 6)                # numeric vector
c("low", "high", "high")  # factor vector
```

Exploring data frames
```
head(df)          # show first rows of df
glimpse(df)       # have a glimpse of df
colnames(df)      # column names
str(df)           # structure of data frame
summary(df)       # summary statistics
```

Getting help
?function_name OR help(function_name)

DATA WRANGLING

Selecting columns
```
select(df, col1, col2, …)
select(df, -col)     #excluding  a column
select(df, starts_with("pattern"))
    options: ends_with("") / contains("")
```

Renaming columns
```
rename(df, new_name = old_name)
rename_with(df, snakecase::to_snake_case)
```

Using the pipe
df %>% function() %>% function()

Filtering the data by row
```
df %>% filter(col == "x")   # if char or factor
df %>% filter(col > x)      # if numeric
```

(Re)Arranging the rows by column
```
arrange(col1, col2, …)
arrange(desc(col)) # in descending order
```

Transforming or adding columns
```
mutate(col = col / 100)        #transform a col
mutate(new_col = log(col))   # add a col
mutate(new_col = if_else(col >=  x, "yes", "no"))
```

Calculating summary statistics, e.g. mean
summarize(new_col = mean(col, na.rm = TRUE))

Calculating summary statistics by a group
```
df %>% group_by(col) %>%
    summarise(new_col = mean(col, na.rm = T))
```

Saving and loading datasets
```
usethis::use_data(df, overwrite = TRUE)
load(here::here("data/df.rda"))
readr::read_csv(here::here("data/df.csv"))
```
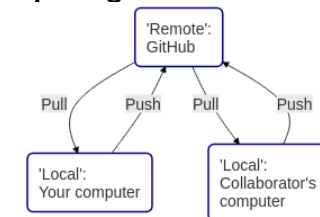
GIT AND GITHUB

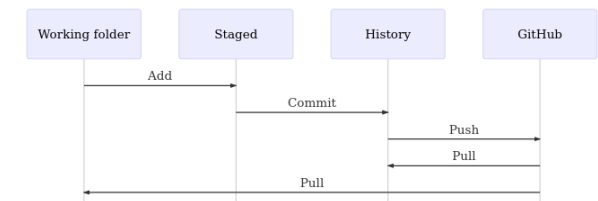**Checking git configuration**
r3::check_git_config()

Commit short cut
Ctrl+Alt+M

Pushing and pulling

States in Git

LOGICAL OPERATORS

<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to
==	equal to
!=	not equal to
!x	not x (if x is true or false)
x | y	x OR y
x & y	x AND y

ABBREVIATIONS:
```
col  – column
df   – data frame
var  – variable
```

R³

DATA VISUALIZATION

Basics format
```
df %>%
    ggplot(aes(x = var1, y = var2, colour = var3) +
    geom_density()
```

Plotting 1 variable
```
geom_density()          # density plot
geom_histogram()        # histogram
geom_bar()              #barplot
```

Plotting 2 continuous variables
```
geom_point()            # scatter plot
geom_hex()              # hex plot
geom_smooth()           # smoothing line
```

Plotting 2 discrete variables
```
geom_bar()                      # stacked bar plot
geom_bar(position = position_dodge())
                                # side-by-side
```

Plotting 2 mixed variables (continuous/discrete)
```
geom_boxplot()          # box plot
geom_jitter()           # jitter plot
geom_violin()           # violin plot
```

Plotting 3 variables
Option 1: add var3 as colour to plot
```
ggplot(aes(x = var1, y = var2, colour = var3)) +
    geom_boxplot()
```

Option 2: Faceting
```
ggplot(aes(x = var1, y = var2)) +
    geom_point() +
    facet_grid(cols = vars(var3))
```

Plotting 5 variables with colour and faceting
```
ggplot(aes(x = var1, y = var2, colour = var3)) +
    geom_point() +
    facet_grid(cols = vars(var4),
    rows = vars(var5))
```

Colour scheme
```
scale_color_viridis_c()
```

Themes
```
theme_bw()
theme_minimal()
theme_classic()
theme_set(theme_bw())  # general theme set
```

Adding plot title, and change x and y axis titles
```
labs(title = "This is a title",
  x = "This is an x axis title",
  y = "This is a y axis title")
```

Creating directory to save plot
```
fs::dir_create("doc/images") #create directory
```

Saving plot
```
ggsave(here::here("doc/images/plot.pdf"),
 base_scatterplot2, width = 7, height = 5)
)
```

R MARKDOWN

New R markdown file
Go to "File -> New File -> R Markdown"

Inserting Chunk
Ctrl+Alt+I or Go to "Code -> Insert Chunk"

Knitting
Ctrl+Shift+K or "Knit" button

Basic Chunk structure
```
```{r}
write your R code here
```
```

Basic chunk, code hidden
```
```{r setup, include = FALSE}
write your set up R code here
```
```

General text formatting
```
# Header1 ## Header. ### Header3
**bold**    # bold.
*italics*   # gives italics.
super^script^       # gives superscript
sub~script~         # gives subscript
-    item 1 # unnumbered list
1.   Item 1  # numbered list
```

Adding images
```
![Caption text](path/to/image.png)` OR
`knitr::include_graphics("path/image.png"))`
```

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col	– column
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var	– variable

R³