COE Intro to R Workshop

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Introduction to R Packages

Installing and Loading R Packages

```
# how to install R packages.
# do this the first time you use the package
install.packages("tidyverse")
# each time you open a new R session, you have to load the package
library(tidyverse)

# check for a package update
update.packages("tidyverse")

# sometimes you may receive an error that a package is not availabe for your version of R

# Installing Outdated Packages

# remotes::install_version() allows to install an outdated version of a package automatically without h

# here is an example
# install_version("MplusAutomation", version = "0.7", lib = old_lib)
```

Set Working Directory

This will tell you where your files will be saved

```
# Wondering what your working directory is set at right now?

getwd() # highlight this code and press ctrl+enter
```

```
## [1] "C:/Users/maria/Desktop/COE R Workshop/COEworkshops"
```

```
# to set your working directory you can use setwd("C:/FILE PATH")

# Example
# setwd("C:/Users/jah2ax/Box Sync/_R/workshops/intro_to_R_spring_2019")
```

Import Data into R

```
# example od importing a .csv SPSS file

data1 <- read.csv("data.csv")


# example of importing a .sav file using package Haven
# you can also import SAS and Stata files with Haven
# install.packages("haven")
library(haven)
data2 <- read_sav("data.sav")

# view the top 6 rows with function head
head(data2)
```

Viewing your Data / Descriptive Statistics

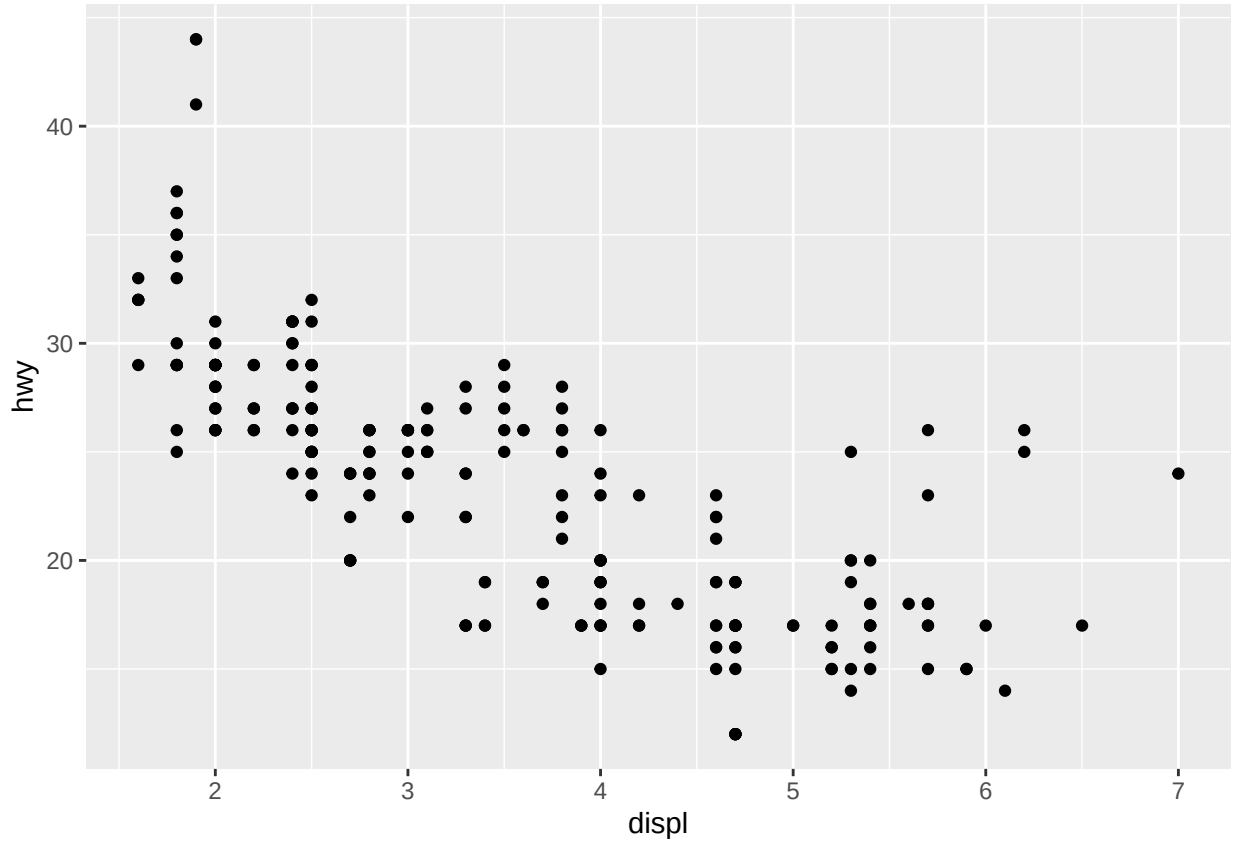
```
# use package "skimr" to get the mean, standard deviation, histogram,
# and percentiles of numeric data

# install.packages("skimr")
library(skimr)

# use skim function to review data
skim(data1)

# use the package "psych" to get the mean, SD, range, min, max, median,
# skewness, and kurtosis of variables in dataset

# install.packages("psych")
library(psych)

#use describe function to review data
describe(data1)
```

Ways of coding: so many ways!

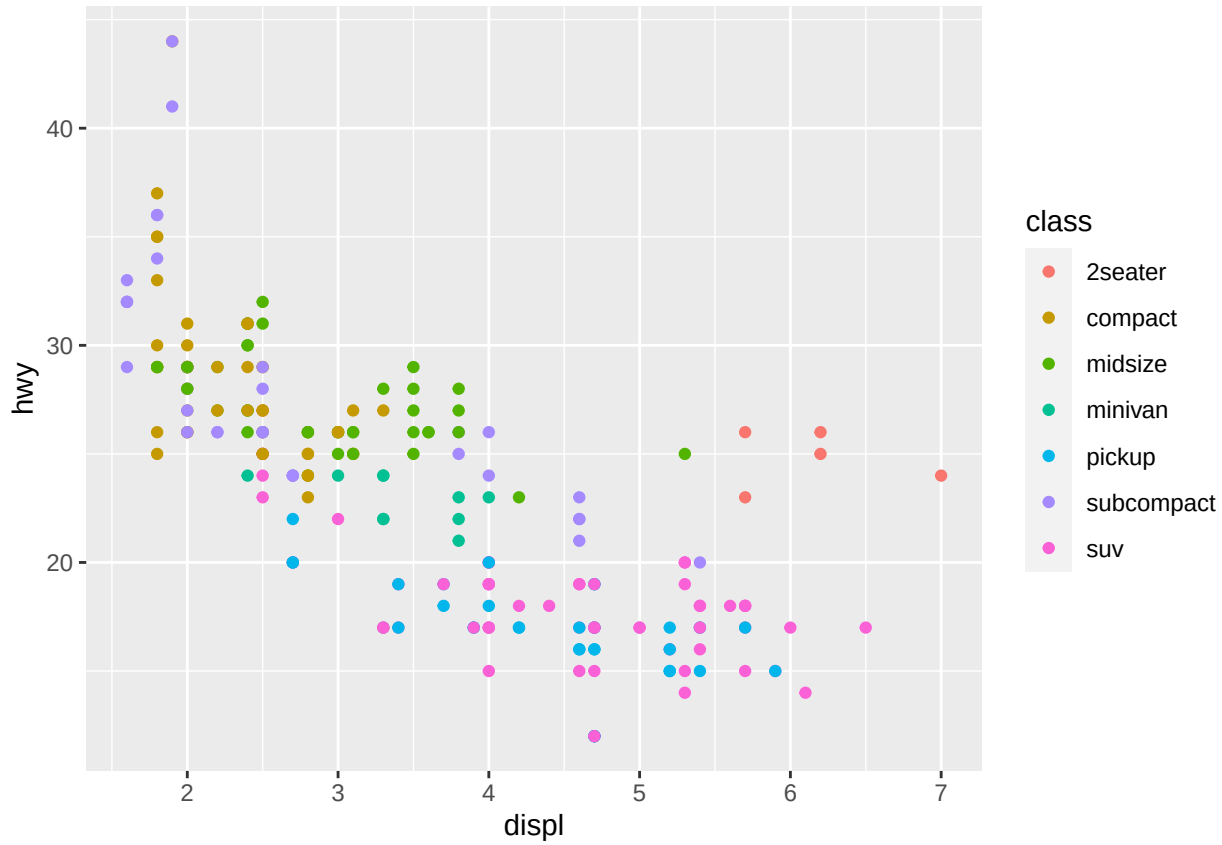
```
data2 <- data2 %>%
  rename(weight = wt) # tidyverse way of renaming a variable name


data1$weight <- data1$wt # base R method for renaming a variable (adds a variable)
```

Vizualizing Your Data: Basics

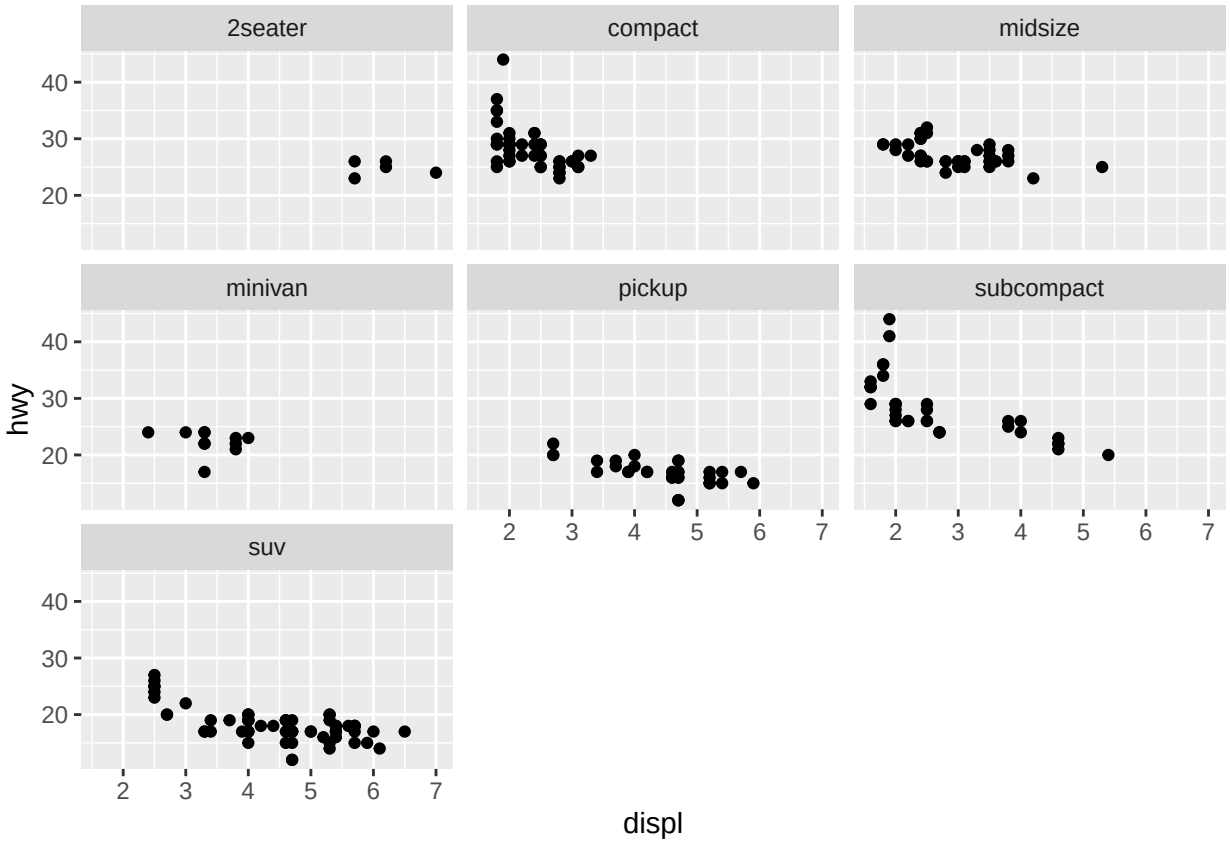
```r
# We will use "ggplot2" to vizualize data
#install.packackges("ggplot2)
library(ggplot2)

# The package ggplot2 comes with a dataset called mtcars already loaded

# Let's create a plot that decribes the relationship between engine size (displ) and
# the variable fuel efficiency (hwy).

ggplot(data = mpg) +
  geom_point(mapping = aes(x = displ, y = hwy))
```




```r
# Do cars with bigger engines use more fuel? Look at the Plots on the left to see
# if you think these data support that hypothesis

# here is a second example, which further divides the data by the type of vehicle (class)

ggplot(data = mpg) +
  geom_point(mapping = aes(x = displ, y = hwy, color = class))
```




```
# Finally, you can also plot data in different facets or graphs by using something called facet_Wrap

ggplot(data = mpg) +
  geom_point(mapping = aes(x = displ, y = hwy)) +
  facet_wrap(~class)
```



Useful R Packages

```
# data vizualization
library(tidyverse)
library(ggplot2)
# APA Tables and Documents
library(apaTables)
library(sjPlot)
library(papaja) # APA manuscripts
# Others
library(shiny) # interactive web applications
library(mice) # multiple imputation
library(lme4) # multilevel modeling
library(lavaan) # structural equation modeling


# if you would like to read about a package, you can simply use one ? followed by the package name

# example of finding tidyverse documentation

?tidyverse

# Wondering about a function, use one ? followed by the function
```

```
?distinct
```

Freely Available R Resources

Access free R tutorials here on DataCamp

Suggested DataCamp Tutorials

- Introduction to R
- Exploratory Data Analysis in R
- Data Vizualization in R

Review the workshop flow by clicking here (*credit to the University of Virginia Libraries*)