ggplot – Aesthetics Mapping

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# 1st layer data

# assign cars fuel economy data to data frame

df <- ggplot2::mpg

# create new variable transmission from variable trans

df <- df %>% mutate(transmission = substr(trans, 1, 1)) %>%

  mutate(transmission = case_when(transmission == "a" ~ "automatic trans.",

                                  transmission == "m" ~ "manual trans."))


# create new variable type_of_drive from variable drv

df <- df %>%

  mutate(type_of_drive = case_when(drv == "f" ~ "front-wheel drive",

                                   drv == "r" ~ "rear-wheel drive",

                                   drv == "4" ~ "4-wheel drive")) %>%

  mutate(type_of_drive = factor(type_of_drive, levels = c("front-wheel drive", "rear-wheel
drive", "4-wheel drive")),

         transmission = factor(transmission, levels = c("manual trans.", "automatic trans.")))


# start building plot with data layer

ggplot(data = df)


# Add aesthetics mapping

# we map:#   - variable displ -> x-axis (displ: engine displacement in litres)

#   - variable hwy   -> y-axis (hwy: higway miles per gallon, car fuel consumption on
highways)

ggplot(data = df, mapping = aes(x = displ, y = hwy))
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# Add geometry
# we would like to create scatterplot:
#   - rendering observations as points
#   - need to determine point size and point transparency (look at original plot)
ggplot(data = df, mapping = aes(x = displ, y = hwy)) +
  geom_point(size = 5, alpha = 1/3)


# Add facets
# we would like to split original plot into subplots by rows and columns:
#   - use facet_grid()
#   - column split by variable type_of_drive
#   - row split by variable transmission
#   - use function argument to allign axis limits to each subplot (scales = "free")
ggplot(data = df, mapping = aes(x = displ, y = hwy)) +
  geom_point(size = 5, alpha = 1/3) +
  facet_grid(transmission ~ type_of_drive, scales = "free")



# Add statistics layer
# we would like to fit linear model to each set of points in each facet (smoothing line):
#   - use fgeom_smooth()
#   - column split by variable type_of_drive
#   - row split by variable transmission
#   - use function argument to allign axis limits to each subplot (scales = "free")
ggplot(data = df, mapping = aes(x = displ, y = hwy)) +
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  geom_point(size = 5, alpha = 1/3) +
  facet_grid(transmission ~ type_of_drive, scales = "free") +
  geom_smooth(method = "lm")



# Add coordinate layer & scales
#   - use Cartesian coordinate system (just for demonstration, we could leave this out - by default Cartesian)
#   - add labels titles and figure title
#   - add scaling layer to x & y axis
#   - scaling x layer: define breaks from 0 to 50 by step size 5
#   - scaling y layer: define breaks from 0 to 10 by step size 0.5
ggplot(data = df, mapping = aes(x = displ, y = hwy)) +
  geom_point(size = 5, alpha = 1/3) +
  facet_grid(transmission ~ type_of_drive, scales = "free") +
  geom_smooth(method = "lm") +
  coord_cartesian() +
  scale_y_continuous(breaks = seq(0,50,5)) +
  scale_x_continuous(breaks = seq(0,10,0.5)) +
  xlab("Engine displacement (volume in litres)") +
  ylab("Highway miles per gallon (MPG)") +
  ggtitle("Car fuel consumption")
```