Introduction

On 11 January 2022 and 25 January 2022 Sam Langton gave NSCR Tidy Tuesday presentations on the exploration and visualization of Starbuck coffeeuse data.In this document both presentations are combined.

[^1]. Here you can find it on the NSCR- website. Here is the First presentation. Here is the Second presentation

Load libraries.

```
library(readr)
library(dplyr)
library(tidyr)
library(stringr)
library(ggplot2)
```

Load data

The data are loaded directly from the TidyTuesday github page.

```
star_df <- read_csv('https://raw.githubusercontent.com/rfordatascience/tidytuesday/master/da
```

Initial explore.

Here are some explorative commands you can use:
- `star-df` opens the dataset and shows you the variables. - `names(star_df)`gives you the names of the 15 variables. - `glimpse(star_df)`shows you the number of rows (often particpants) and columns (often variables) and also informs you about the kind of variables. - `dim(star_df)` informs you about number of rows and columns.
- `sum(is.na(star_df))` show you the number of missing variables.

```r
star_df
```

```
# A tibble: 1,147 x 15
   product_n~1 size   milk  whip serv_~2 calor~3 total~4 satur~5 trans~6 chole~7
   <chr>       <chr> <dbl> <dbl>   <dbl>   <dbl>   <dbl>   <dbl> <chr>     <dbl>
 1 brewed cof~ short     0     0     236       3     0.1       0 0             0
 2 brewed cof~ tall      0     0     354       4     0.1       0 0             0
 3 brewed cof~ gran~     0     0     473       5     0.1       0 0             0
 4 brewed cof~ venti     0     0     591       5     0.1       0 0             0
 5 brewed cof~ short     0     0     236       3     0.1       0 0             0
 6 brewed cof~ tall      0     0     354       4     0.1       0 0             0
 7 brewed cof~ gran~     0     0     473       5     0.1       0 0             0
 8 brewed cof~ venti     0     0     591       5     0.1       0 0             0
 9 brewed cof~ short     0     0     236       3     0.1       0 0             0
10 brewed cof~ tall      0     0     354       4     0.1       0 0             0
# ... with 1,137 more rows, 5 more variables: sodium_mg <dbl>,
#   total_carbs_g <dbl>, fiber_g <chr>, sugar_g <dbl>, caffeine_mg <dbl>, and
#   abbreviated variable names 1: product_name, 2: serv_size_m_l, 3: calories,
#   4: total_fat_g, 5: saturated_fat_g, 6: trans_fat_g, 7: cholesterol_mg
```

```r
names(star_df)
```

```
 [1] "product_name"    "size"            "milk"            "whip"
 [5] "serv_size_m_l"   "calories"        "total_fat_g"     "saturated_fat_g"
 [9] "trans_fat_g"     "cholesterol_mg"  "sodium_mg"       "total_carbs_g"
[13] "fiber_g"         "sugar_g"         "caffeine_mg"
```

```r
glimpse(star_df)
```

```
Rows: 1,147
Columns: 15
$ product_name    <chr> "brewed coffee - dark roast", "brewed coffee - dark ro~
$ size            <chr> "short", "tall", "grande", "venti", "short", "tall", "~
$ milk            <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 2, ~
$ whip            <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
$ serv_size_m_l   <dbl> 236, 354, 473, 591, 236, 354, 473, 591, 236, 354, 473,~
$ calories        <dbl> 3, 4, 5, 5, 3, 4, 5, 5, 3, 4, 5, 5, 3, 4, 5, 5, 35, 50~
$ total_fat_g     <dbl> 0.1, 0.1, 0.1, 0.1, 0.1, 0.1, 0.1, 0.1, 0.1, 0.1, 0.1,~
$ saturated_fat_g <dbl> 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,~
$ trans_fat_g     <chr> "0", "0", "0", "0", "0", "0", "0", "0", "0", "0", "0",~
$ cholesterol_mg  <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 10,~
$ sodium_mg       <dbl> 5, 10, 10, 10, 5, 10, 10, 10, 5, 5, 5, 5, 5, 5, 5, 5, ~
$ total_carbs_g   <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 5, 5, ~
$ fiber_g         <chr> "0", "0", "0", "0", "0", "0", "0", "0", "0", "0", "0",~
$ sugar_g         <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 5, 5, ~
$ caffeine_mg     <dbl> 130, 193, 260, 340, 15, 20, 25, 30, 155, 235, 310, 410~
```

```r
dim(star_df)
```

```
[1] 1147   15
```

```r
sum(is.na(star_df))
```

```
[1] 0
```

Subset brewed coffee.

When you want to look at a specific subset with the product_name brewed coffee for example you can define this as:.

```r
brew_df <- star_df %>%
  filter(str_detect(product_name, "brewed coffee"))
```

Quick clean for the plot.

- Make another subsample and call it `big_ones_df`.
  -Use only the variables `product_name`, `size`, `milk`, `whip` and `calories-trans_fat_g`).

- Use only when `size`is grande.
- change `whip` into a character variable.

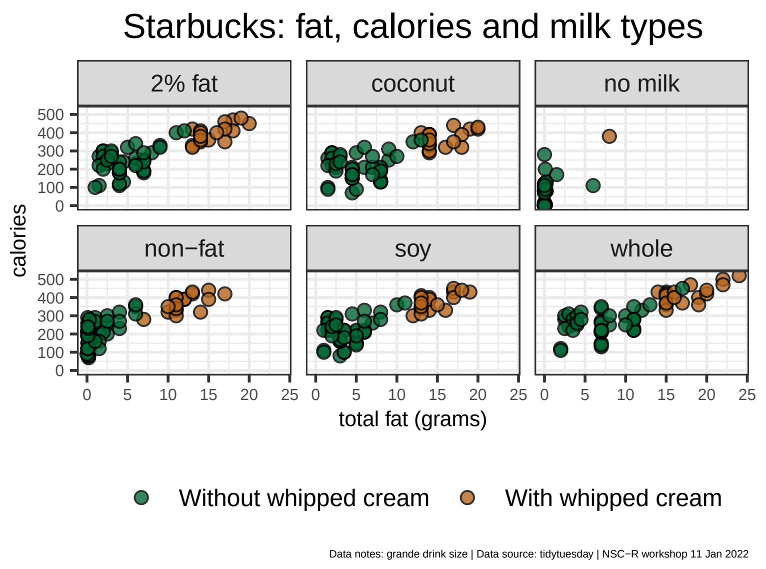
- Recode categories of `milk`from 0, 1, 2, 3, 4 5 into no milk, non-fat, 2% fat, soy, coconut, whole.

```
big_ones_df <- star_df %>%
  select(product_name, size, milk, whip, calories:trans_fat_g) %>%
  filter(size == "grande") %>%
  mutate(whip_char = as.character(whip),
         milk_labs = recode(milk,
                            `0` = "no milk",
                            `1` = "non-fat",
                            `2` = "2% fat",
                            `3` = "soy",
                            `4` = "coconut",
                            `5` = "whole")) # These categories are on the tt git page.
```

What in the relationship between calories and fat?

Can you plot between `calories`(y) and `total_fat_g` (x)? Show the diffence on `whip_char'and show it for the six`milk-labs‘ you recoded.

```
my_plot_gg <- ggplot(data = big_ones_df) +
  geom_point(mapping = aes(x = total_fat_g, y = calories, fill = whip_char),
             size = 2, alpha = 0.8, pch = 21, colour = "black") +
  facet_wrap(~milk_labs) +
  labs(title = "Starbucks: fat, calories and milk types",
       caption = "Data notes: grande drink size | Data source: tidytuesday | NSC-R workshop
       fill = NULL, x = "total fat (grams)") +
  scale_fill_manual(values = c("#036635", "#b5651d"),
                    labels = c("Without whipped cream", "With whipped cream")) +
  theme_bw() +
  theme(legend.position = "bottom",
        axis.text = element_text(size = 6),
        axis.title = element_text(size = 8),
        plot.title = element_text(hjust = 0.5),
        plot.caption = element_text(size = 4))
my_plot_gg
```



Save.

Save the plot on your computer as a png-file. Here is place in a projectmap and a submap images which I made on my computer. Change the path if necessary for your computer.

```
ggsave(my_plot_gg, file = "images/starbucks_plot.png",
       height = 12, width = 12, unit = "cm")
```

Counting frequencies

For counting frequencies you always can use different methods. We show some of them.

This is the R base-way for counting the variable `whip`for example.

```
table(star_df$whip)
```

```
  0   1 
864 283 
```

This is the grouping-way.

```
star_df %>%
  group_by(whip) %>%
  tally()
```

```
# A tibble: 2 x 2
   whip     n
  <dbl> <int>
1     0   864
2     1   283
```

This is a better way (thanks Wim!).

```
freq_df <- count(star_df, whip)
freq_df
```

```
# A tibble: 2 x 2
   whip     n
  <dbl> <int>
1     0   864
2     1   283
```

Basic cleaning

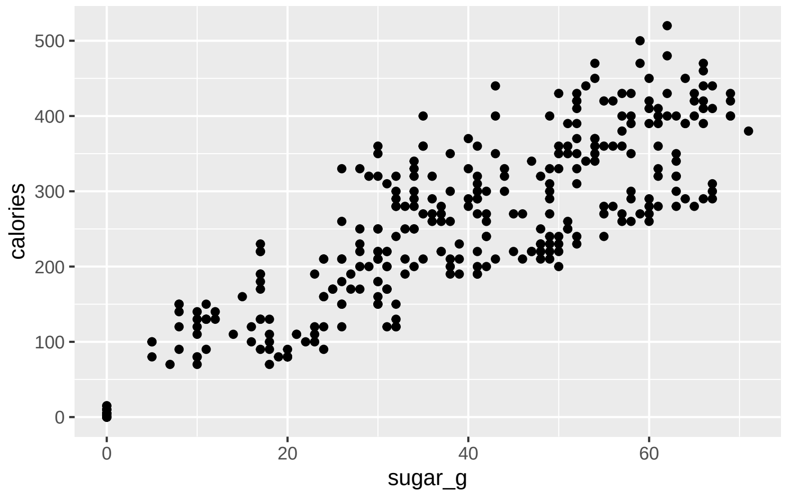
Here we do some basic cleaning. We select six variables and look only at variables of which the `size` is grande. We call this dataset `star_clean`.

```
star_clean_df <- star_df %>%
  select(product_name, size, milk, whip, calories, sugar_g) %>%
  filter(size == "grande")
```

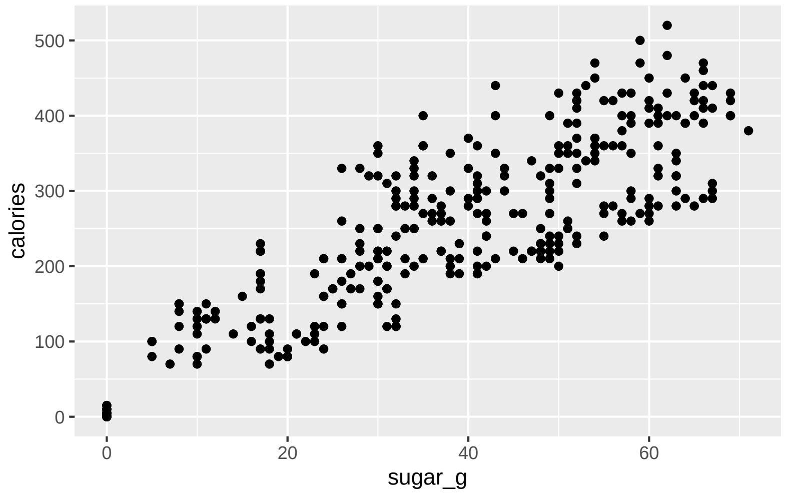
Basic plot

Let us plot it on different ways.The first three are similar.

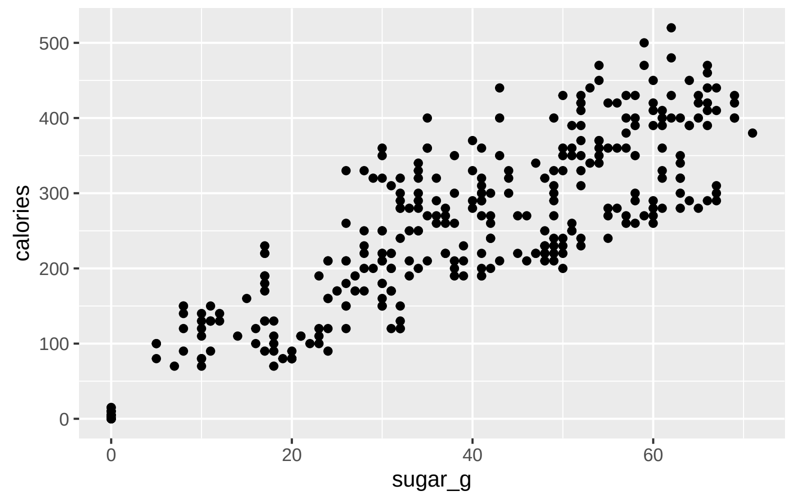
```
ggplot(data = star_clean_df, mapping = aes(x = sugar_g, y = calories)) +
  geom_point()
```



```
ggplot(data = star_clean_df) +
  geom_point(mapping = aes(x = sugar_g, y = calories))
```

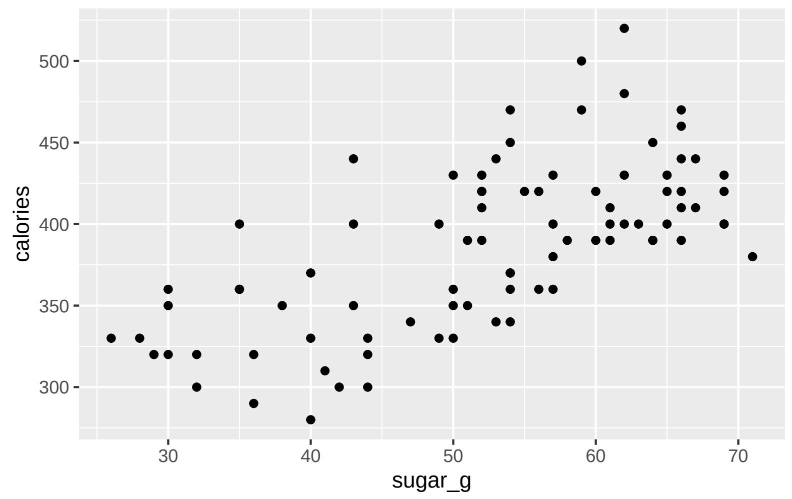


```
ggplot() +
  geom_point(data = star_clean_df, mapping = aes(x = sugar_g, y = calories))
```



Then we plot the coffee of which the `whip`is 1.

```
star_clean_df %>%
  filter(whip == 1) %>%
  ggplot() +
  geom_point(mapping = aes(x = sugar_g, y = calories))
```



Change milk class.

For the next plot we first change the class of the variable `milk` into a character variable and save it as a different dataset.

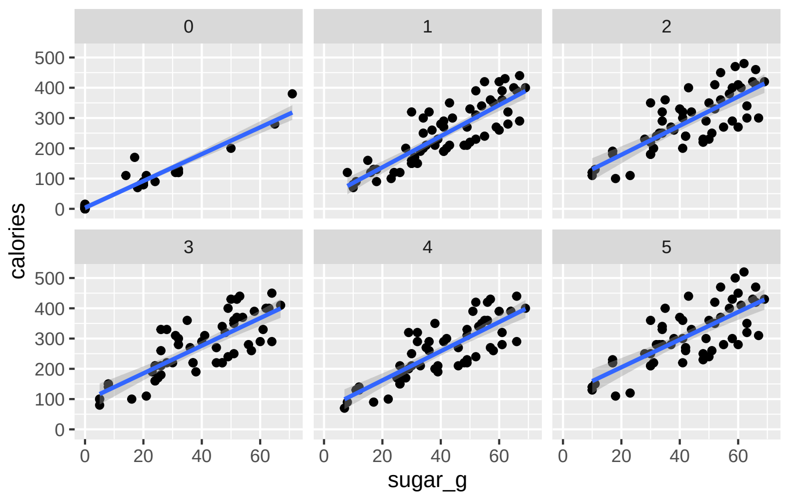
```
star_clean_df <- star_clean_df %>%
  mutate(milk_char = as.character(milk))
```

Extend.

We plot this new dataset on three different ways.

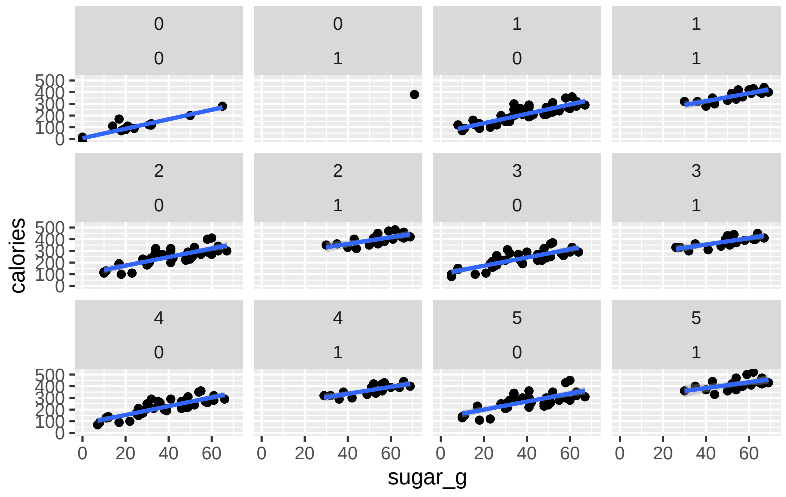
```
ggplot(data = star_clean_df) +
  geom_point (mapping = aes(x = sugar_g, y = calories)) +
  geom_smooth(mapping = aes(x = sugar_g, y = calories), method = "lm") +
  facet_wrap(~milk_char)
```

```
`geom_smooth()` using formula = 'y ~ x'
```

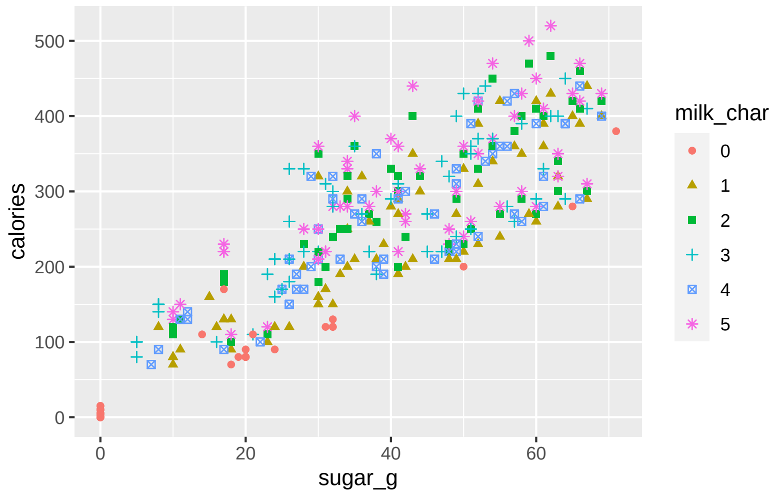


```
ggplot(data = star_clean_df, mapping = aes(x = sugar_g, y = calories)) +
  geom_point() +
  geom_smooth(method = "lm") +
  facet_wrap(vars(milk_char, whip))
```

```
`geom_smooth()` using formula = 'y ~ x'
```



```
ggplot(data = star_clean_df) +
  geom_point(mapping = aes(x = sugar_g, y = calories, shape = milk_char, colour = milk_char)
```



Reference