Module 2- Descriptive Statistics

Descriptive Statistics

```
library(tidyverse)

# read data
low_birth <- read.csv("./lowbwt_ALL.csv")

# select relevant variables
low_birth <- dplyr::select(low_birth, age, race, smoke, bwt)

# change smoking status to a factor
low_birth <- mutate(low_birth,
                    smoke = ifelse(smoke == 1, "yes", "no"))
```

Numerical Summaries

We recommend the use of the package `{gtsummary}` for descriptive tables.

NOTE: you will need to install the `{gtsummary}` package. Run `install.packages("gtsummary")` in the Console.

```
# install and load gtsummary
# install.packages("gtsummary")
library(gtsummary)
```

#StandWithUkraine

```
# create overall summary table
low_birth %>%
  tbl_summary(missing_text = "(Missing)",   # counts missing values
              statistic = list(all_continuous() ~ "{mean} ({sd})"),  # what to do with cont

    label = list(age ~ "Age",          # label variables
                 race ~ "Race",
                 smoke ~ "Smoking Status",
                 bwt ~ "Birth Weight")) %>%
  bold_labels() %>%
  italicize_levels()
```

Characteristic	N = 189[1]
Age	23 (5)
Race	
black	26 (14%)
other	67 (35%)
white	96 (51%)
Smoking Status	74 (39%)
Birth Weight	2,945 (729)

[1] Mean (SD); n (%)

```
# create summary table by smoking status
low_birth %>%
  tbl_summary(by = "smoke",   # stratify by smoking status
              missing_text = "(Missing)",
    statistic = list(all_continuous() ~ "{mean} ({sd})"),
    label = list(age ~ "Age",
                 race ~ "Race",
                 smoke ~ "Smoking Status",
                 bwt ~ "Birth Weight")) %>%
  bold_labels() %>%
  italicize_levels()
```

Characteristic	no, N = 115[1]	yes, N = 74[1]
Age	23 (5)	23 (5)
Race		
black	16 (14%)	10 (14%)
other	55 (48%)	12 (16%)
white	44 (38%)	52 (70%)
Birth Weight	3,055 (752)	2,773 (660)

[1] Mean (SD); n (%)

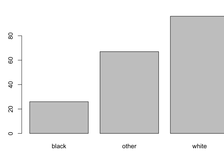
Graphical Summaries

We can also describe this data with plots.

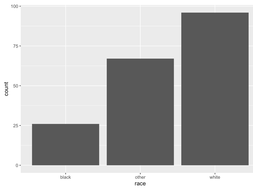
```
### bar graph of race using base R
# first you need to create a summary table
low_birth_race_summary <-
  low_birth %>%
  group_by(race) %>%
  summarise(count = n())

# view summary table
low_birth_race_summary
```

```
# A tibble: 3 × 2
  race  count
  <chr> <int>
1 black    26
2 other    67
3 white    96
```

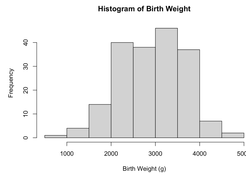
```
# plot the barplot using the summary table
barplot(height = low_birth_race_summary$count,
        names = low_birth_race_summary$race)
```



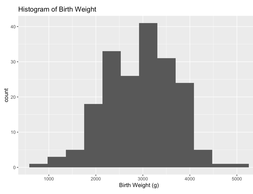

```
### bar graph of race using ggplot
ggplot(low_birth) +
  geom_bar(aes(x = race))
```



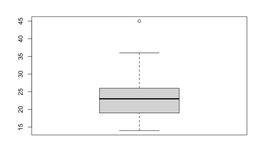

```
### histogram of birth weight using base R
hist(low_birth$bwt,
     main = "Histogram of Birth Weight",
     xlab = "Birth Weight (g)")
```




```
### histogram of birth weight using ggplot
ggplot(low_birth) +
  geom_histogram(aes(x = bwt), bins = 12) + # we can choose an appropriate number

  labs(title = "Histogram of Birth Weight",
       x = "Birth Weight (g)")
```




```
### boxplot of age using base R
boxplot(low_birth$age)
```




```
### boxplot of age using ggplot
ggplot(low_birth) +
  geom_boxplot(aes(y = age))
```