BIO144

Week 1

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Reaction time Male vs Female

In this short report we try to find out if there is a significant difference in reaction times between Males and Females. We use data, which we have collectet in the lecture on monday.

```
the_URL <- "https://docs.google.com/spreadsheets/d/e/2PACX-1vQFgYX1QhF9-UXep22XmPow1ZK5nbFHix9nkQIa0
class_RTs <- read_csv(the_URL)
```

```
## Parsed with column specification:
## cols(
##   Timestamp = col_character(),
##   `Please enter the unique ID code you gave yourself.` = col_character(),
##   `What was your biological sex at birth?` = col_character(),
##   `Using your PREFERRED hand to take the test: Please enter your FIRST reaction time in milliseco
##   `Please enter your score on the Verbal Memory test. (Use your preferred hand to take the test.)
##   `Please enter your score on the Number Memory test. (Use your preferred hand to take the test.)
##   `Please enter your score on the Visual Memory test. (Use your preferred hand to take the test.)
##   `Please enter your weight, in kilograms.` = col_double(),
##   `Are you right handed, left handed, or ambidextrous?` = col_character(),
##   `Using your NON-PREFERRED hand to take the test: Please enter your average reaction time in mil
##   `Using your PREFERRED hand to take the test: Please enter your SECOND reaction time in millisec
##   `Using your PREFERRED hand to take the test: Please enter your THIRD reaction time in milliseco
##   `Using your PREFERRED hand to take the test: Please enter your FOURTH reaction time in millisec
##   `Using your PREFERRED hand to take the test: Please enter your FIFTH reaction time in milliseco
##   `Using your PREFERRED hand to take the test: Please enter your AVERAGE reaction time in millise
##   `Pick a random whole number from 1 to 10, and enter it.` = col_double()
## )
```

```
names(class_RTs) <- c("Timestamp", "ID", "Gender", "Pref_Reaction_time_1",
                      "Verbal_memory_score", "Number_memory_score",
                      "Visual_memory_score",
                      "Weight_kgs", "Handed", "Nonpref_Reaction_time_ave",
                      "Pref_Reaction_time_2", "Pref_Reaction_time_3",
                      "Pref_Reaction_time_4", "Pref_Reaction_time_5",
                      "Pref_Reaction_time", "Random_number")
class_RTs %>%
  group_by(Gender) %>%
  summarise(number = n())
```

```
## # A tibble: 2 x 2
##   Gender number
##   <chr>   <int>
## 1 Female    132
## 2 Male       68
```

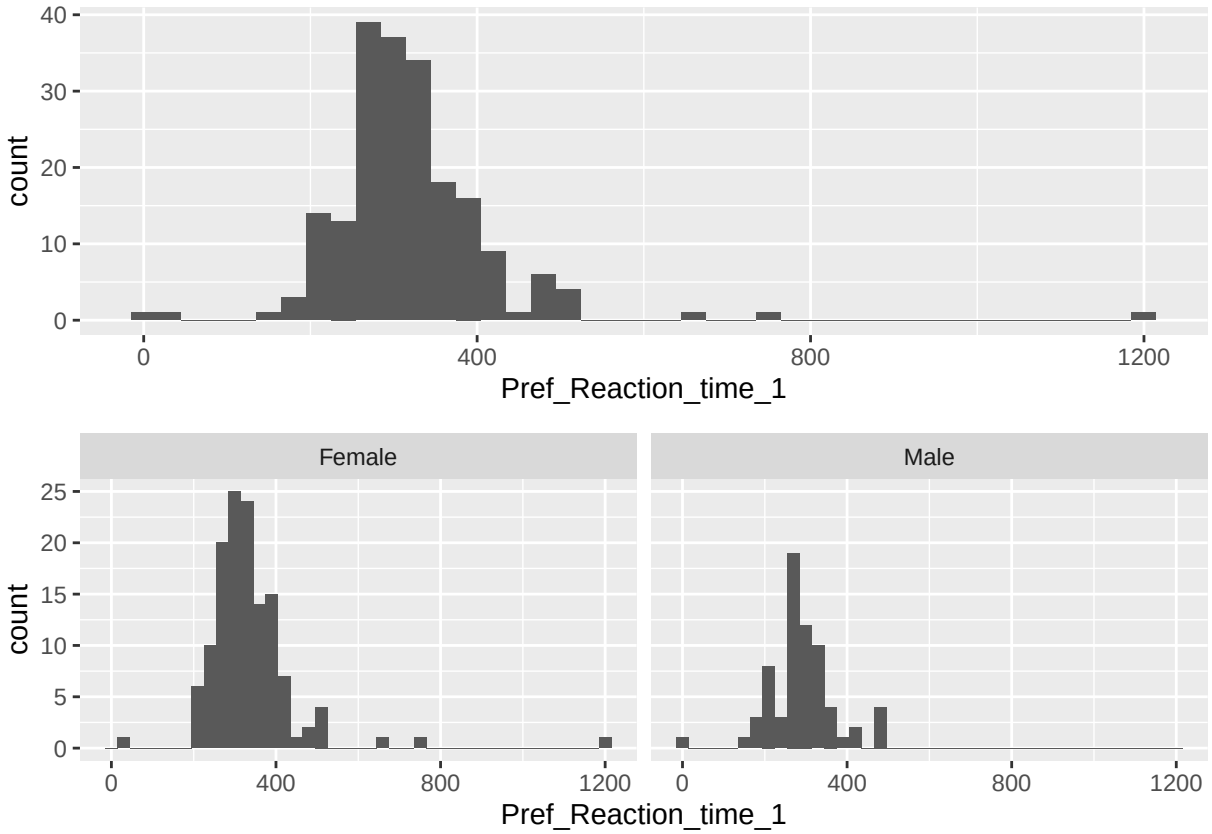
```
library(ggplot2)
library(gridExtra)
```

```
##
```

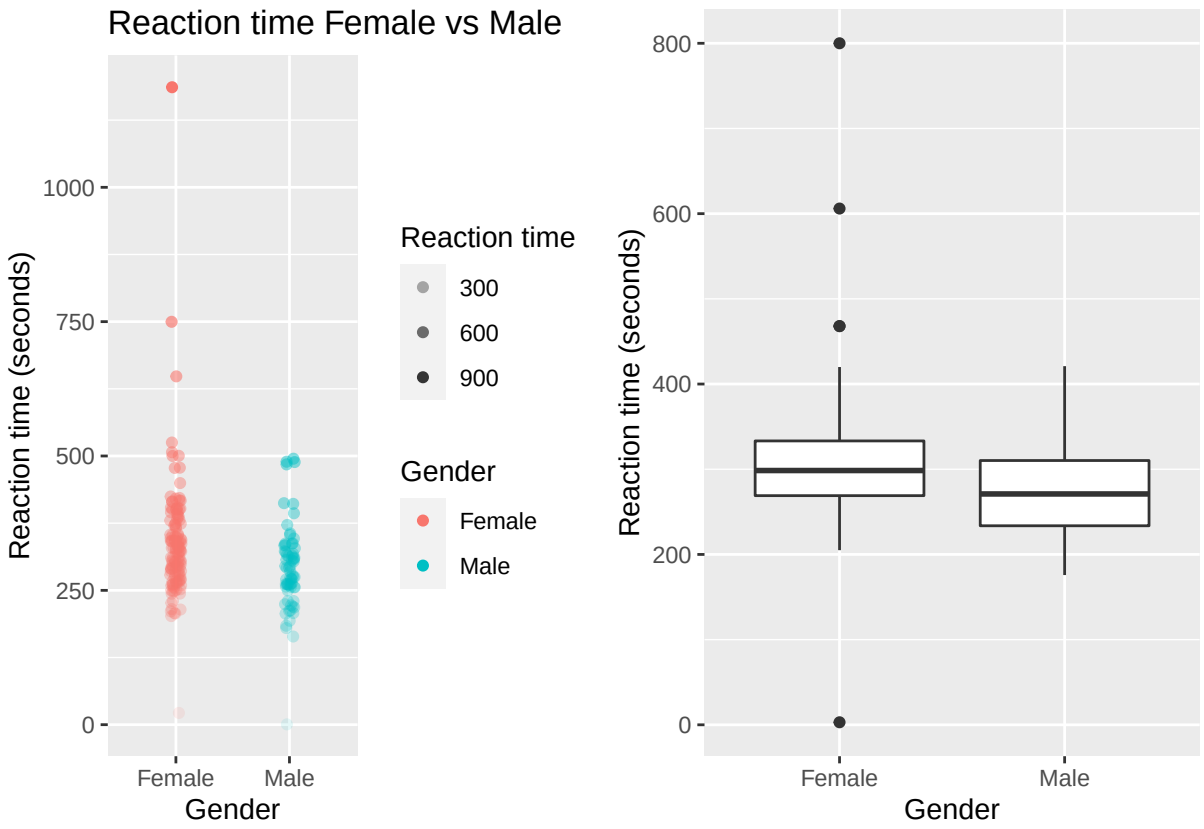
```
## Attaching package: 'gridExtra'
```

```
## The following object is masked from 'package:dplyr':
##
##     combine
```

```
p1 <- ggplot(data=class_RTs, aes(x=Pref_Reaction_time_1)) +
  geom_histogram(binwidth = 30)
p2 <- ggplot(data=class_RTs, aes(x=Pref_Reaction_time_1)) +
  geom_histogram(binwidth=30) +
  facet_grid(.~Gender)
grid.arrange(p1,p2,nrow=2)
```




```
p1 <- ggplot(data=class_RTs, aes(x=Gender, y=Pref_Reaction_time_1,color=Gender,alpha=Pref_Reaction_t
  geom_jitter(width=0.05) + labs(alpha='Reaction time',title='Reaction time Female vs Male',y='React
p2 <- ggplot(data=class_RTs, aes(x=Gender, y=Pref_Reaction_time)) +
  geom_boxplot() +
  ylab("Reaction time (seconds)")
grid.arrange(p1,p2,ncol=2)
```



Findings

The last part of the exercise is to report your findings, including the direction and size of the difference in reaction times between males and females, and a measure of uncertainty in that difference.

- The direction of the differences is than Females have a longer reaction time than males.
- mean in females: 307.9606 mean in males: 277.6809
- As we can see, the p-value is very low so it is unlikely to reach this result with the assuption that there is no difference between males and females in reaction time
- The confidence interwall shows that we have a probability of 95% that the difference will be between 9.7 and 50.8 ms in reaction time between males and females.