# Final_Project _Draft

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5/3/2022

## Intro

The Winter Olympic Game is a major international multi-sport event held once every four years for soprts practiced on snow and ice.

### What

This is just simple project about US winter Olympic Gold medalists for the past 20 years.

### Why

The reason I chose this topic is because winter Olympic just finished this year in Beijing, China. I did see some improvements of Chinese athletes this year, it seems that they won some gold medals that were big challenges for them in the past. I am curious to know how has Team US been doing.

### How

I created an excel file which contains data of US Winter Olympics Gold Medalists from year 2002 to year 2022.I found these data from Wikipedia.I will use R commands to show some statistics and graphs.

## Body

**I first imported my excel data by using the read_excel, and My excel file has the following columns:**

```
library(readxl)
```

```
## Warning: package 'readxl' was built under R version 4.1.3
```

```
winter_olympics <- read_excel("winter olympics.xlsx")
```

```
names(winter_olympics)
```

```
## [1] "YEAR"       "NAME"       "SPORT"      "WOMEN"      "MEN"
## [6] "GENDER"     "Gold Medal"
```

**1. I would like to see how many gold medals did Team US won for the past 20 years?**

```
table(winter_olympics$`Gold Medal`)
```

```
##
##  0  1
##  5 54
```

**There are total of 54 gold medals Team Us won in the past 20 years.**

**2. I would like to compare women vs. men who won more medals overall and compare the ratios.**

```
table(winter_olympics$WOMEN)
```

```
##
##  0  1
## 37 22
```

```
table(winter_olympics$MEN)
```

```
##
##  0  1
## 31 28
```

**Based on the summaries, men and women each have 59 athletes, there were 22 women won the gold medals and 28 men won, the ratio calculations are as following:**

```
table(winter_olympics$WOMEN)/table(winter_olympics$`Gold Medal`)
```

```
##
##         0         1
## 7.4000000 0.4074074
```

```
table(winter_olympics$MEN)/table(winter_olympics$`Gold Medal`)
```

```
##
##         0         1
## 6.2000000 0.5185185
```

**As we can see the above calculations, overall, men have higher ratio of winning gold medals than women for the past 20 years in winter Olympics.**

**3. I want to find out which year did TEAM US won the most Gold Medals in Winter Olympics?**

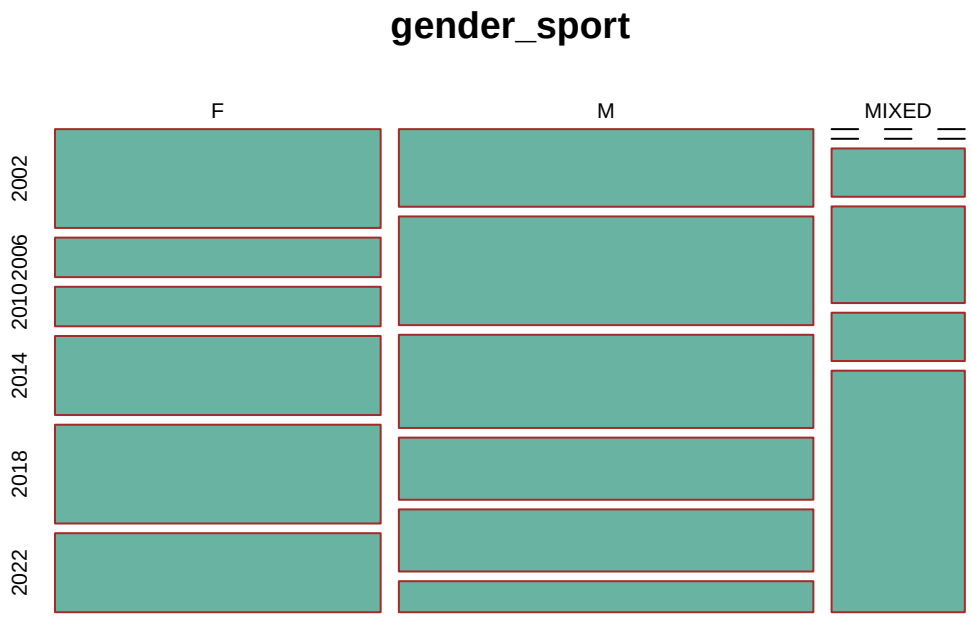
```
aggregate(`Gold Medal` ~ YEAR, data=winter_olympics, FUN=sum)
```

```
##   YEAR Gold Medal
## 1 2002         10
## 2 2006          9
## 3 2010          9
## 4 2014          9
## 5 2018          9
## 6 2022          8
```

**As we can tell that Team US won the most gold medals in year 2002 winter Olympic with a total of 10 gold medals. Year 2022 Team US won least gold medals, with a total of 8. But overall, Team US did not have a big difference in terms of winning the number of gold medals at each Olympic game.**

**4. below is the mosaicplot I use to further represent the portion of gender winning gold medals in winter olympics in different year.**

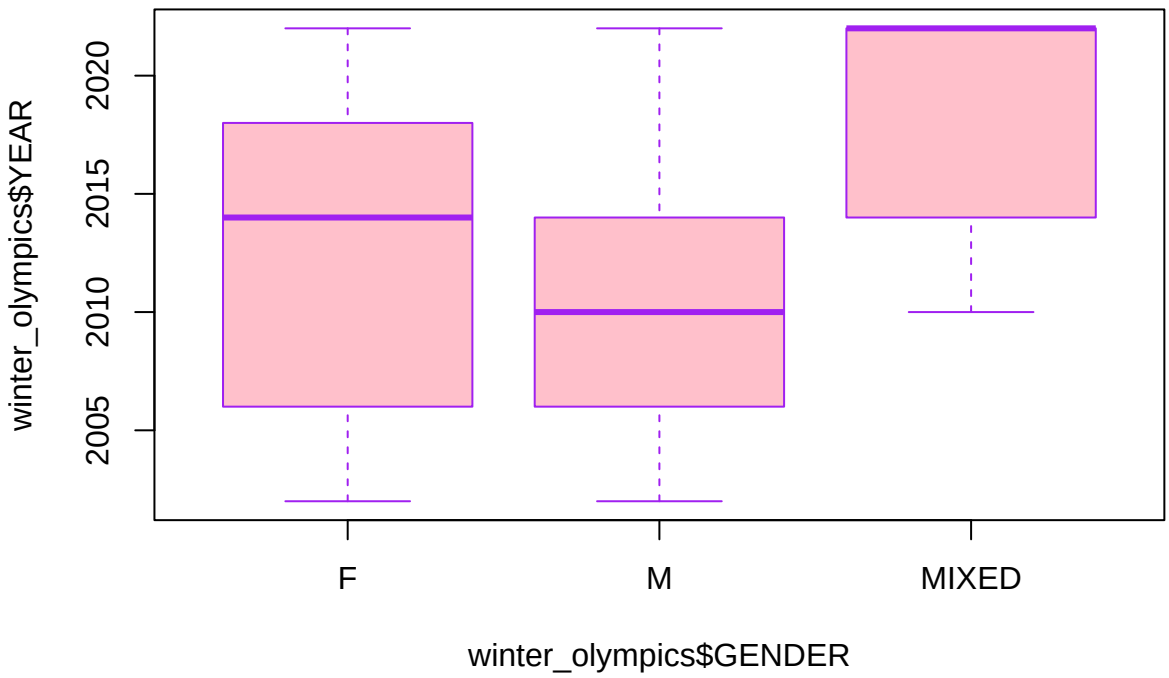
```
gender_sport <- table(winter_olympics$GENDER, winter_olympics$YEAR)
mosaicplot(gender_sport, border ="brown", col="#69b3a2")
```



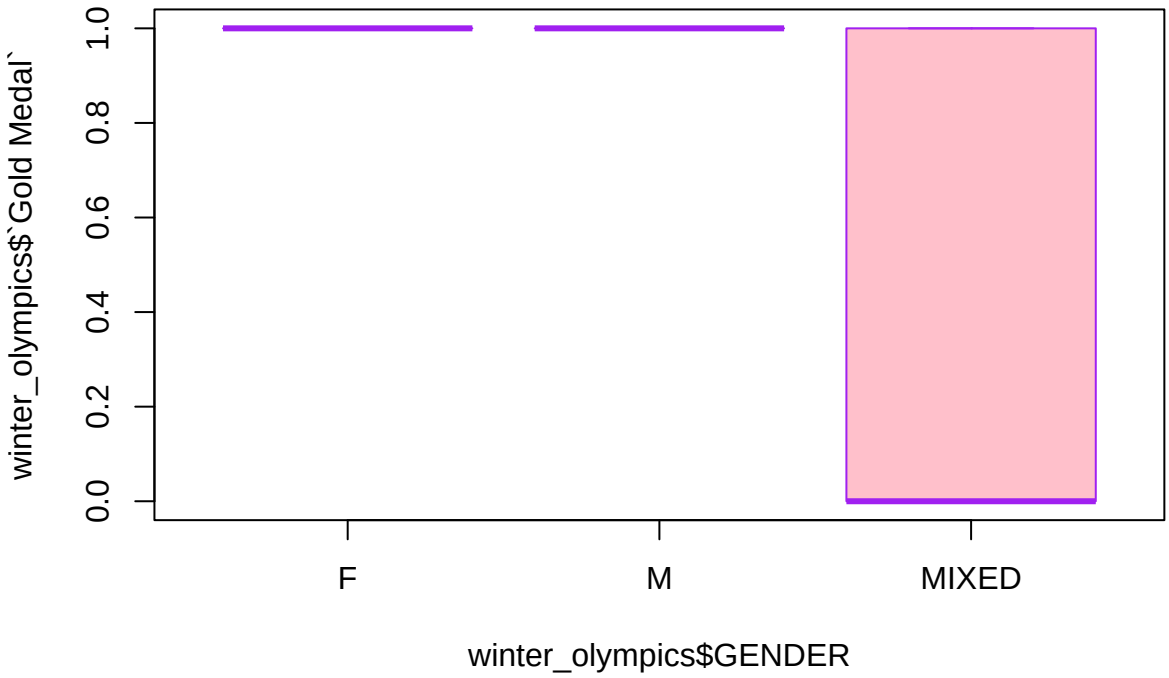

**As the mosaicplot shows women won more gold medals in year 2002,2014, 2018 and 2022.**

**5. below are the box plots of showing gender portion of different Olympic games**

```
boxplot(winter_olympics$YEAR ~ winter_olympics$GENDER, border= "purple", col="pink")
```

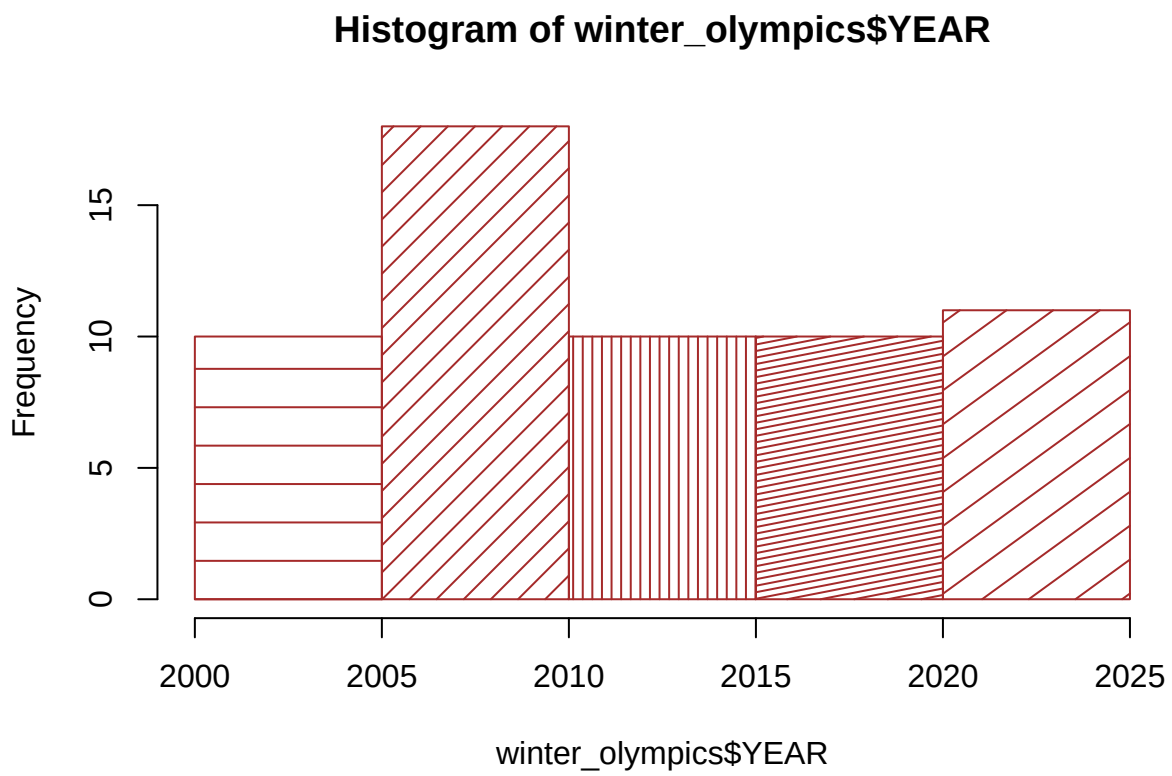



```
boxplot(winter_olympics$`Gold Medal` ~ winter_olympics$GENDER, border="purple", col="pink")
```




6. Below is the the histogram showing the Frequency of each year of Olympic games.

```
hist(winter_olympics$YEAR, density=c(5,10,20,30,7) , angle=c(0,45,90,11,36) , col="brown")
```




```
table(winter_olympics$YEAR)
```

```
##
## 2002 2006 2010 2014 2018 2022
##   10    9    9   10   10   11
```

**6.I would like to see which sports Team US won the most medals,I will use tidyverse to demonstrate this.**

```
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 4.1.3
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.6     v purrr   0.3.4
## v tibble  3.1.7     v dplyr   1.0.9
## v tidyr   1.2.0     v stringr 1.4.0
## v readr   2.1.2     v forcats 0.5.1
```

```
## Warning: package 'ggplot2' was built under R version 4.1.3
```

```
## Warning: package 'tibble' was built under R version 4.1.3
```

```
## Warning: package 'tidyr' was built under R version 4.1.3

## Warning: package 'readr' was built under R version 4.1.3

## Warning: package 'purrr' was built under R version 4.1.3

## Warning: package 'dplyr' was built under R version 4.1.3

## Warning: package 'forcats' was built under R version 4.1.3

## -- Conflicts --------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
winter_olympics%>% group_by(SPORT)%>% summarise(n=n())
```

```
## # A tibble: 13 x 2
##    SPORT                        n
##    <chr>                    <int>
##  1 Alpine skiing                7
##  2 Bobsled                      1
##  3 Bobsleigh                    2
##  4 Cross-country skiing         2
##  5 Curling                      1
##  6 Figure skating               5
##  7 Freestyle skiing             9
##  8 Ice hockey                   1
##  9 Nordic combined              1
## 10 Short track speed skating    2
## 11 Skeleton                     2
## 12 Snowboarding                18
## 13 Speed skating                8
```

**As we can see from the above, Team US won the most gold medals in Snowboarding with 18 gold medals in total.**

# Topics From Class

## Topic 1:

R Markdown-I really like how many functions R Markdown has offered. We can easily convert the files to word, pdf and html by using Knit. We can also insert R commands in between our texts and run it by single sentence or run the whole commands.

## Topic 2:

Github-I am still a beginner for Github, I learned how to push R markdown files to Github to share with others.I am sure there are ohter cool functions in Github, I just need to explore more.

### Topic 3:

Probability-I used probability calculation for my project to show women and men's ratio in winter olympic games.

### Topic 4:

Tidyservice-I used tidyservice to show which sport Team USA won the most gold medals in winter olympics, because the column sport are not numbers, they are strings, I couldn't get it to work in the basic R, tidyservice has the functions to group strings.

### Topic 5:

table, histogram, barplots-I used table command to show a summary of how many men or women in total won the Olympic gold medals. Histogram and barplots help show the different graphs we can use in R studio.

## Conclusion

This final project really helps me review some of the knowledge and skills we covered in class, such as R markdown, Tidy service, probability calculations, barplots, etc. I think this is a good way to put what we learned into practices.I also learned how to add colors to my graphs by reviewing other peers' projects. I learned a lot from the final project feedback section as well, everyone's project is unique and covered different aspects of what we learned during this semester. I do face some challenges, for example, I haven't figured out how to add colors to my barplot graphs, but overall, this is a great learning experience for me.