Final_Project _Draft

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Intro

The Winter Olympic Game is a major international multi-sport event held once every four years for sports 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?

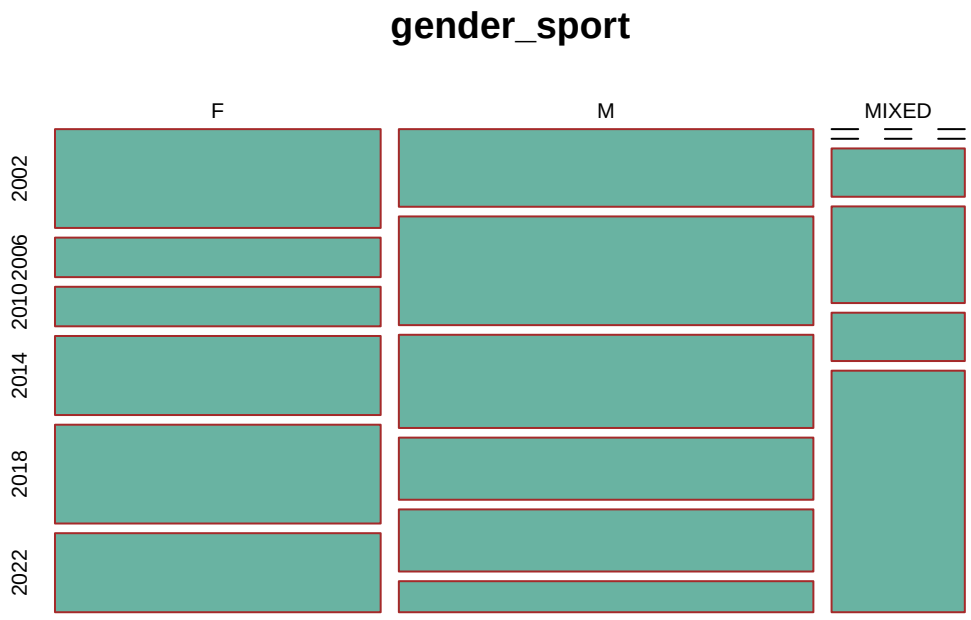
```
aggregate(`Gold Medal` ~ YEAR, data=winter_olympics, FUN=sum)
```

```
##   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.

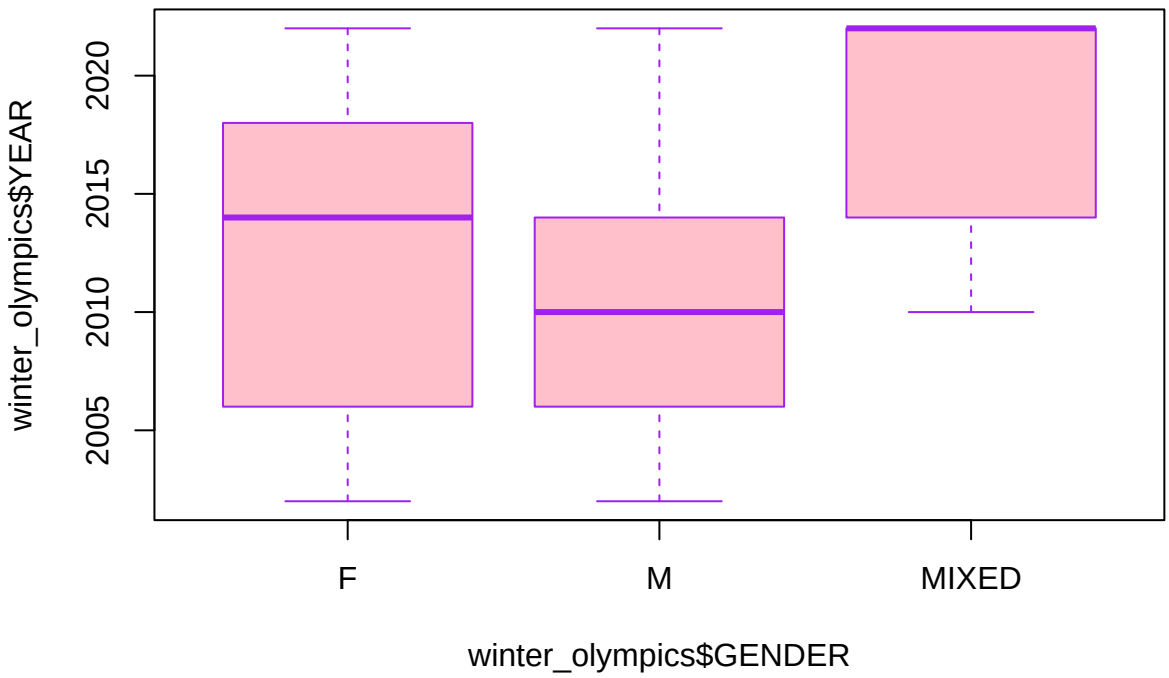
```
gender_sport <- table(winter_olympics$GENDER, winter_olympics$YEAR)
mosaicplot(gender_sport, border ="brown", col="#69b3a2")
```



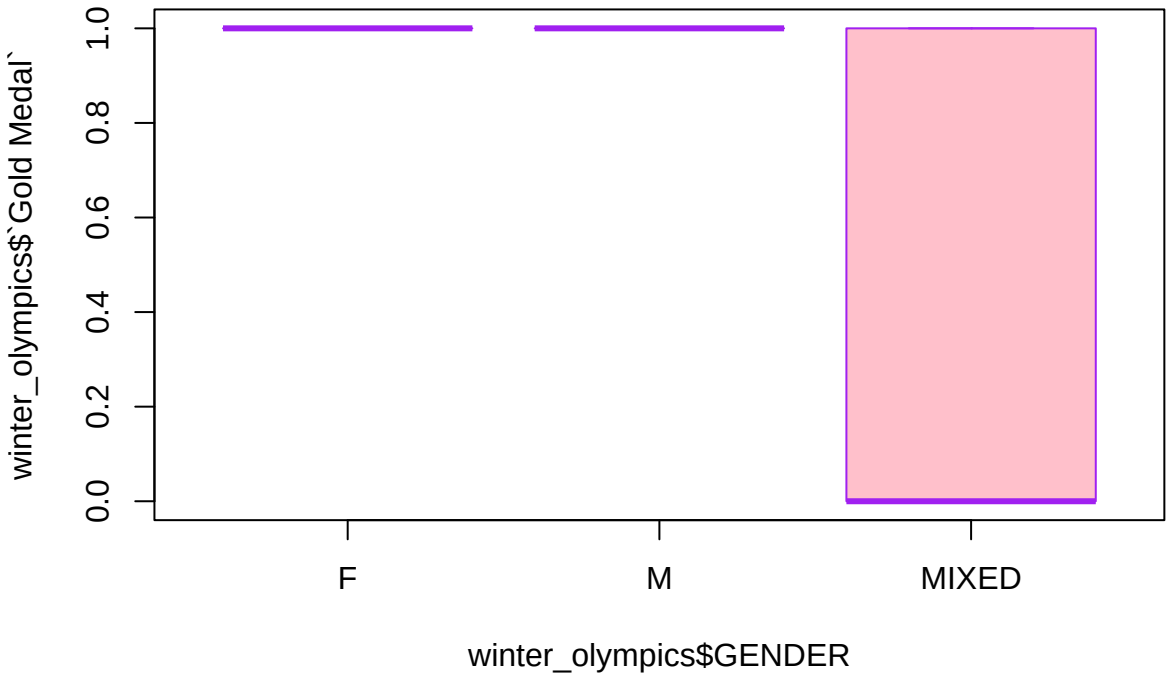
As the mosaicplot shows women won more gold medals in year 2002,2014, 2018 and 2022.

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")
```

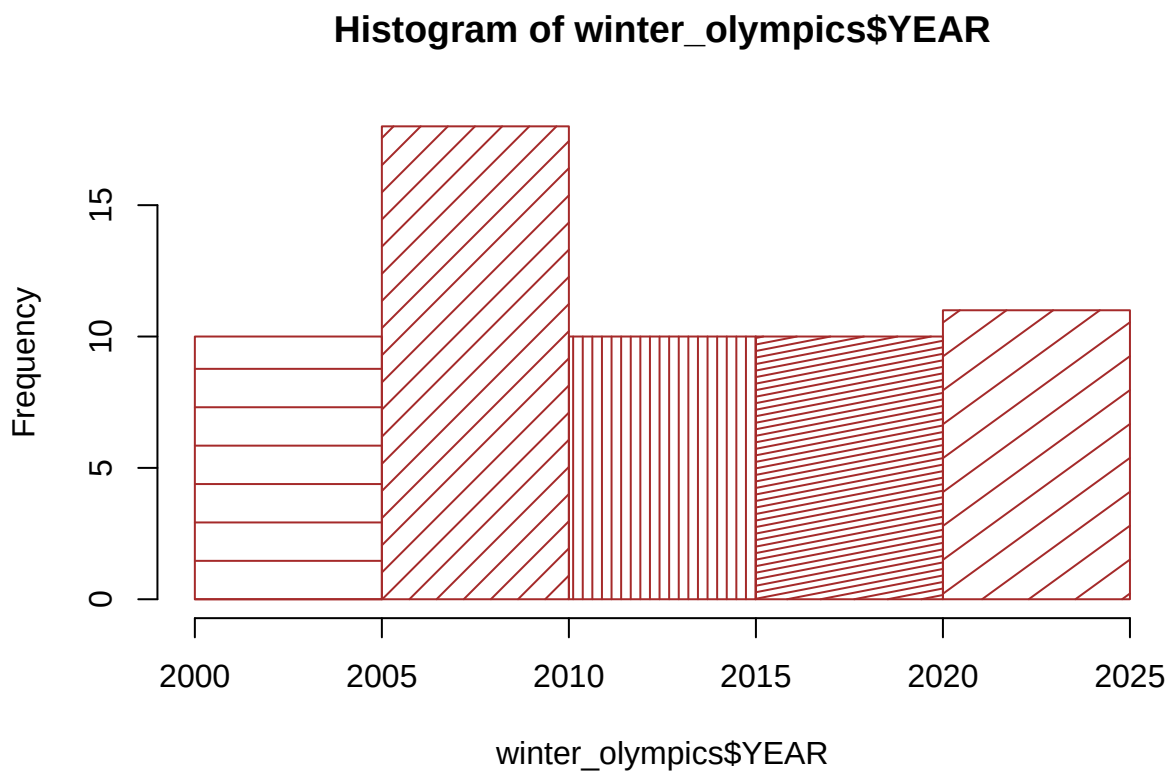



```
boxplot(winter_olympics$`Gold Medal` ~ winter_olympics$GENDER, border="purple", col="pink")
```



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.