

Processing large datasets with R - exam: Exercise 3

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```
library(dplyr)

##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
library(ggplot2)
library(gridExtra)

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

Part 1

Question 1a & Question 1b

```
swo <- read.csv("datasets_exam/summer_winter_olympics.csv")

dim(swo)

## [1] 146  17

nrow(swo)

## [1] 146

ncol(swo)

## [1] 17

head(swo)
```

	X.9	Team..IOC.code.	X..Summer	X	X.1	X.2	Total	X..Winter	X.3	X.4	X.5
## 1	1	Afghanistan (AFG)	13	0	0	2	2	0	0	0	0
## 2	2	Algeria (ALG)	12	5	2	8	15	3	0	0	0
## 3	3	Argentina (ARG)	23	18	24	28	70	18	0	0	0
## 4	4	Armenia (ARM)	5	1	2	9	12	6	0	0	0

```
## 5 5 Australasia (ANZ) 2 3 4 5 12 0 0 0 0
## 6 6 Australia (AUS) 25 138 153 177 468 18 5 3 4
## Total.1 X..Games X.6 X.7 X.8 Combined.total
## 1 0 13 0 0 2 2
## 2 0 15 5 2 8 15
## 3 0 41 18 24 28 70
## 4 0 11 1 2 9 12
## 5 0 2 3 4 5 12
## 6 12 43 143 156 181 480
```

```
colnames(swo) <- c(
  "index",
  "NOC",
  "summer_played",
  "summer_gold",
  "summer_silver",
  "summer_bronze",
  "summer_total",
  "winter_played",
  "winter_gold",
  "winter_silver",
  "winter_bronze",
  "winter_total",
  "both_played",
  "both_gold",
  "both_silver",
  "both_bronze",
  "both_total"
)
```

Question 1c

```
table(swo$summer_played)
```

```
##
## 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
## 3 2 6 1 17 3 1 7 8 2 7 10 13 5 8 11 4 2 3 5 4 5 3 2 5 5
## 27
## 4
```

Question 1d

```
for (column in tail(colnames(swo), -2)) {
  print(column)
  print("FREQUENCY TABLE")
  print(table(swo[[column]]))
}
```

```
## [1] "summer_played"
## [1] "FREQUENCY TABLE"
##
## 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
## 3 2 6 1 17 3 1 7 8 2 7 10 13 5 8 11 4 2 3 5 4 5 3 2 5 5
## 27
```

```

## 4
## [1] "summer_gold"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 5 6 7 8 9 12 13 14 15 16 17 18 21 23 25
## 47 16 9 8 2 3 6 3 1 3 1 1 2 1 1 1 2 1 2 1
## 26 28 30 33 37 39 42 43 45 47 49 51 56 59 64 72 77 81 88 101
## 1 1 1 1 2 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1
## 130 133 138 143 153 167 174 198 201 202 236 395 976
## 1 1 1 1 1 1 1 1 1 1 1 1 1
## [1] "summer_silver"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 5 6 7 8 9 10 11 12 15 17 18 20 21 24 25
## 22 27 16 5 5 7 4 4 3 4 1 1 1 1 1 1 1 1 2 1
## 26 27 29 30 32 33 38 42 49 52 54 59 67 68 73 82 84 85 94 99
## 1 1 1 2 1 1 1 1 2 1 1 1 2 1 1 2 1 2 1 1
## 122 126 129 144 153 164 166 182 223 272 319 758
## 1 1 1 2 1 1 1 1 1 1 1 1
## [1] "summer_bronze"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 17 19 20 21
## 23 20 13 5 6 5 2 1 3 2 4 8 2 1 1 3 1 1 1 1
## 24 25 27 28 29 35 36 38 39 40 43 45 53 55 65 68 69 78 80 81
## 1 1 1 3 2 2 1 1 1 1 1 1 1 2 1 1 1 1 1 1
## 104 117 119 120 125 127 128 142 165 176 177 185 217 246 272 296 666
## 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1
## [1] "summer_total"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 5 6 7 8 9 10 12 13 15 17 18
## 1 26 12 7 9 1 2 4 3 2 3 4 1 1 1 1
## 19 20 21 22 23 24 25 26 27 28 33 44 45 47 52 60
## 3 1 2 1 3 3 1 3 1 1 1 1 1 1 1 1
## 62 67 70 76 83 86 88 99 108 110 112 115 118 131 142 143
## 1 1 1 2 1 2 1 1 1 1 1 1 1 1 1 1
## 148 179 185 204 208 214 243 266 271 278 301 302 397 398 409 468
## 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## 473 476 483 549 573 671 780 1010 2400
## 1 1 1 1 1 1 1 1 1
## [1] "winter_played"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 5 6 7 8 9 10 11 13 14 15 16 17 18 19 20 22
## 45 11 6 6 4 3 19 7 4 3 4 2 2 1 1 4 2 4 2 4 12
## [1] "winter_gold"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 4 5 6 7 8 9 10 11 12 26 31 37 39 42 49 50 59
## 109 5 5 2 1 2 1 1 1 2 1 1 1 1 2 1 1 1 2 1
## 62 78 96 118
## 1 2 1 1
## [1] "winter_silver"

```

```

## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 6 7 8 9 15 17 22 31 34 36 38 40 55 57 62
## 104 5 6 3 4 3 1 1 1 1 2 1 1 1 1 1 3 1 1 1
## 78 102 111
## 2 1 1
## [1] "winter_bronze"
## [1] "FREQUENCY TABLE"
##
## 0 1 3 4 5 7 8 9 10 12 13 15 18 19 35 43 47 48 53 54
## 105 7 4 3 3 1 2 1 1 1 1 1 1 1 1 3 1 1 1 2 1
## 57 59 81 83 100
## 1 1 1 1 1
## [1] "winter_total"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 4 5 6 7 9 11 12 15 19 20 23 24 25 26 39 45 53
## 101 4 3 1 2 2 4 1 1 1 2 1 1 1 1 1 1 1 1 2
## 109 110 114 124 138 144 161 170 194 209 218 281 329
## 1 2 1 1 1 1 1 1 1 1 1 1 1 1
## [1] "both_played"
## [1] "FREQUENCY TABLE"
##
## 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
## 2 2 3 2 2 3 1 5 5 4 17 7 8 8 5 5 1 5 8 3 3 1 2 4 2 2
## 28 30 32 33 34 36 37 38 39 40 41 42 43 45 46 47 48 49
## 1 4 3 1 1 1 2 2 1 1 3 1 1 3 2 2 4 3
## [1] "both_gold"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 5 6 7 8 9 10 13 14 15 17 18
## 46 16 10 8 1 2 7 2 1 3 1 2 1 1 2 2
## 21 23 25 26 30 35 36 38 39 42 43 51 52 54 67 70
## 2 2 1 1 1 1 1 2 1 1 1 1 1 1 1 1
## 72 77 88 97 107 114 121 140 143 167 174 182 192 193 213 233
## 1 1 1 1 1 1 1 1 1 2 1 1 1 1 1 1
## 235 246 252 473 1072
## 1 1 1 1 1
## [1] "both_silver"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 5 6 7 8 9 10 11 13 15 19 20 21 24 25 26
## 21 26 17 6 5 7 3 3 3 2 2 2 2 1 1 2 1 2 1 1
## 28 30 32 42 44 53 57 59 60 67 69 82 87 89 94 99 111 113 123 143
## 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## 146 154 156 160 162 165 166 200 204 254 260 276 376 860
## 2 1 1 1 1 1 1 1 1 1 1 1 1 1
## [1] "both_bronze"
## [1] "FREQUENCY TABLE"
##
## 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20
## 22 20 13 5 6 5 2 1 3 2 3 9 2 1 1 1 1 1 1 1
## 22 23 24 25 27 28 29 36 37 38 39 41 45 55 56 59 60 68 69 81
## 2 1 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1

```

```
## 90 94 113 116 120 132 139 143 147 160 162 169 173 174 177 181 228 230 270 284
## 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## 293 355 749
## 1 1 1
## [1] "both_total"
## [1] "FREQUENCY TABLE"
##
## 1 2 3 4 5 6 7 8 9 10 12 13 15 17 18 19
## 26 11 7 10 1 2 4 3 3 3 4 1 1 1 1 1
## 21 22 23 24 25 26 27 28 29 34 40 45 49 59 60 62
## 3 1 2 2 1 4 1 1 1 2 1 1 1 1 1 1
## 67 68 70 76 86 87 88 91 100 108 110 122 133 135 137 147
## 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## 168 180 208 220 243 291 296 302 304 323 376 443 448 463 477 480
## 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## 482 519 521 526 627 663 780 782 806 1204 2681
## 1 1 1 1 1 1 1 1 1 1 1 1
```

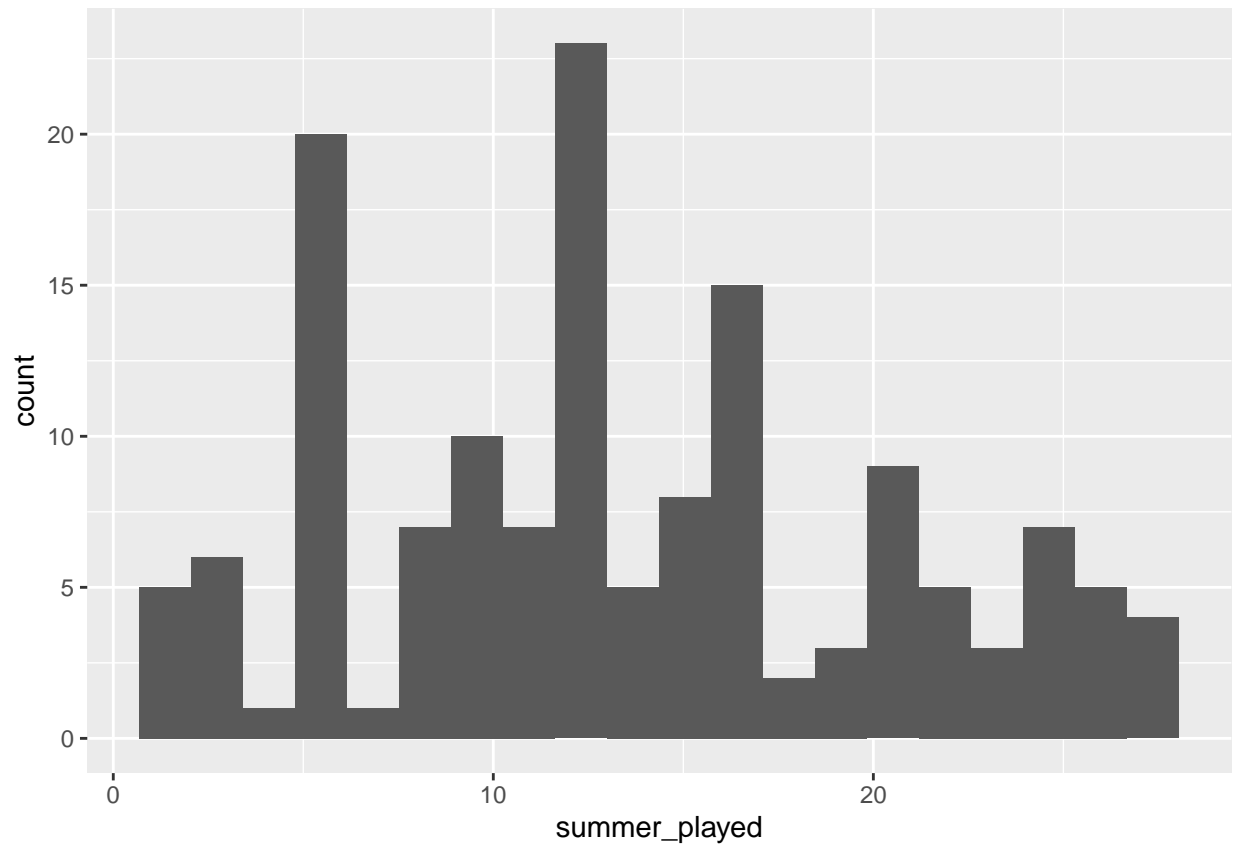
```
summary(swo)
```

```
##      index      NOC      summer_played      summer_gold
## Min.   : 1.00   Length:146   Min.   : 1.00   Min.   : 0.00
## 1st Qu.: 37.25   Class :character 1st Qu.: 8.00   1st Qu.: 0.00
## Median : 73.50   Mode  :character  Median :13.00   Median : 3.00
## Mean   : 73.50                Mean  :13.38   Mean   : 32.94
## 3rd Qu.:109.75                3rd Qu.:18.00   3rd Qu.: 23.00
## Max.   :146.00                Max.   :27.00   Max.   :976.00
## summer_silver  summer_bronze  summer_total  winter_played
## Min.   : 0.00   Min.   : 0.00   Min.   : 0.00   Min.   : 0.000
## 1st Qu.: 1.00   1st Qu.: 1.00   1st Qu.: 2.00   1st Qu.: 0.000
## Median : 4.00   Median : 6.00   Median : 12.00  Median : 5.000
## Mean   : 32.71   Mean   : 35.13   Mean   :100.78   Mean   : 6.596
## 3rd Qu.: 26.75   3rd Qu.: 28.75   3rd Qu.: 85.25   3rd Qu.:10.000
## Max.   :758.00   Max.   :666.00   Max.   :2400.00  Max.   :22.000
## winter_gold    winter_silver  winter_bronze  winter_total
## Min.   : 0.000   Min.   : 0.000   Min.   : 0.000   Min.   : 0.00
## 1st Qu.: 0.000   1st Qu.: 0.000   1st Qu.: 0.000   1st Qu.: 0.00
## Median : 0.000   Median : 0.000   Median : 0.000   Median : 0.00
## Mean   : 6.568   Mean   : 6.555   Mean   : 6.493   Mean   : 19.62
## 3rd Qu.: 0.750   3rd Qu.: 1.750   3rd Qu.: 1.000   3rd Qu.: 4.75
## Max.   :118.000   Max.   :111.000   Max.   :100.000   Max.   :329.00
## both_played    both_gold      both_silver    both_bronze
## Min.   : 1.00   Min.   : 0.00   Min.   : 0.00   Min.   : 0.00
## 1st Qu.:11.00   1st Qu.: 0.00   1st Qu.: 1.00   1st Qu.: 1.00
## Median :15.00   Median : 3.00   Median : 4.00   Median : 6.50
## Mean   :19.98   Mean   : 39.51   Mean   : 39.27   Mean   : 41.62
## 3rd Qu.:26.00   3rd Qu.: 24.50   3rd Qu.: 28.00   3rd Qu.: 29.00
## Max.   :49.00   Max.   :1072.00  Max.   :860.00   Max.   :749.00
## both_total
## Min.   : 1.00
## 1st Qu.: 2.25
## Median : 12.00
## Mean   :120.40
## 3rd Qu.: 87.75
## Max.   :2681.00
```

Part 4

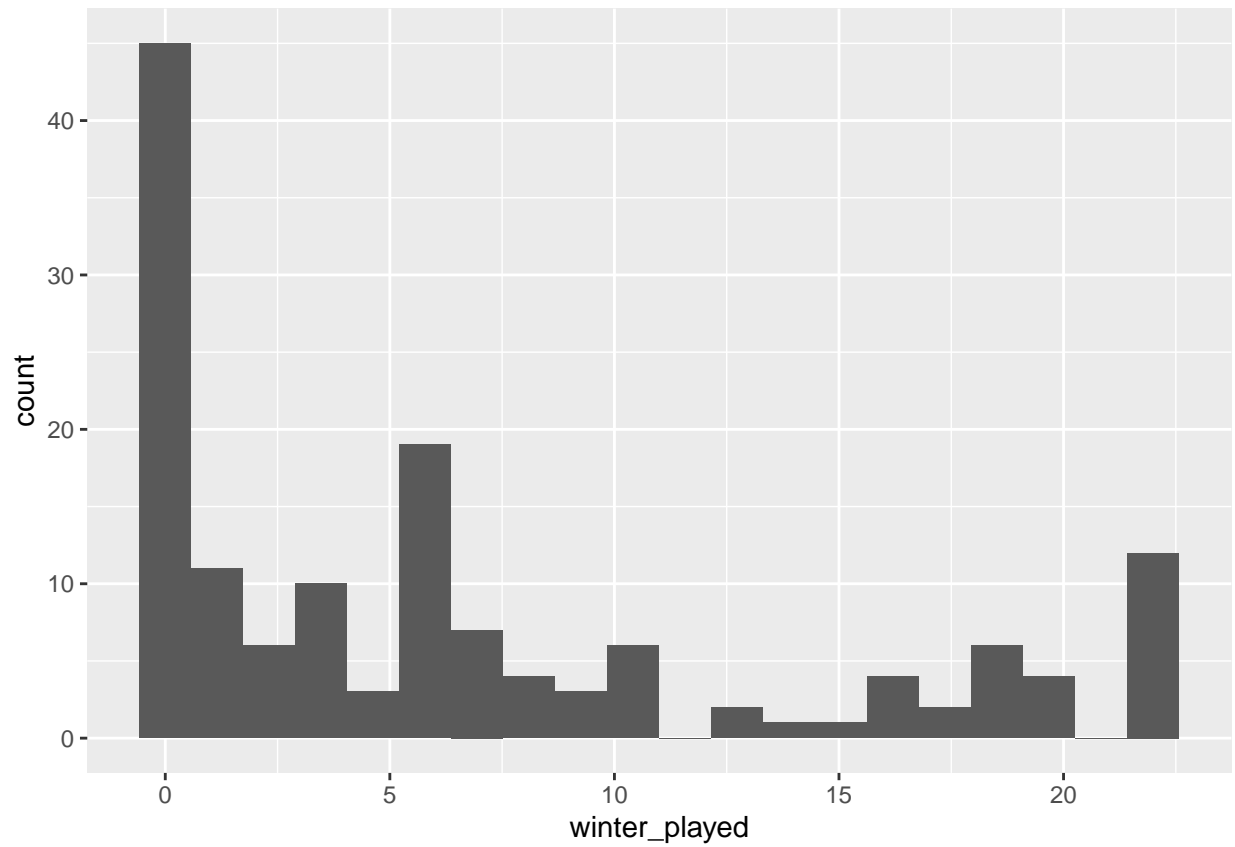
Question 4a

```
hist_summer_played <- swo %>%  
  ggplot(aes(summer_played)) +  
  geom_histogram(bins = 20)  
hist_summer_played
```



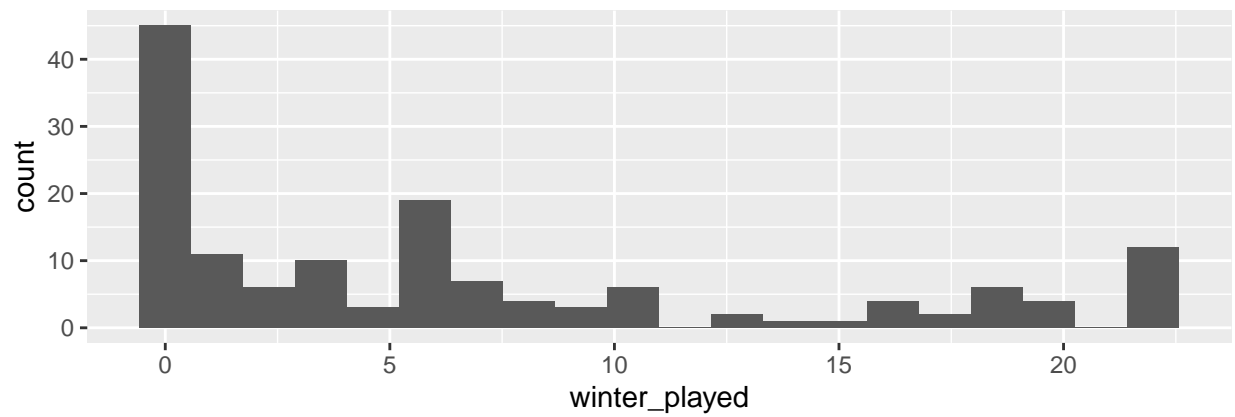
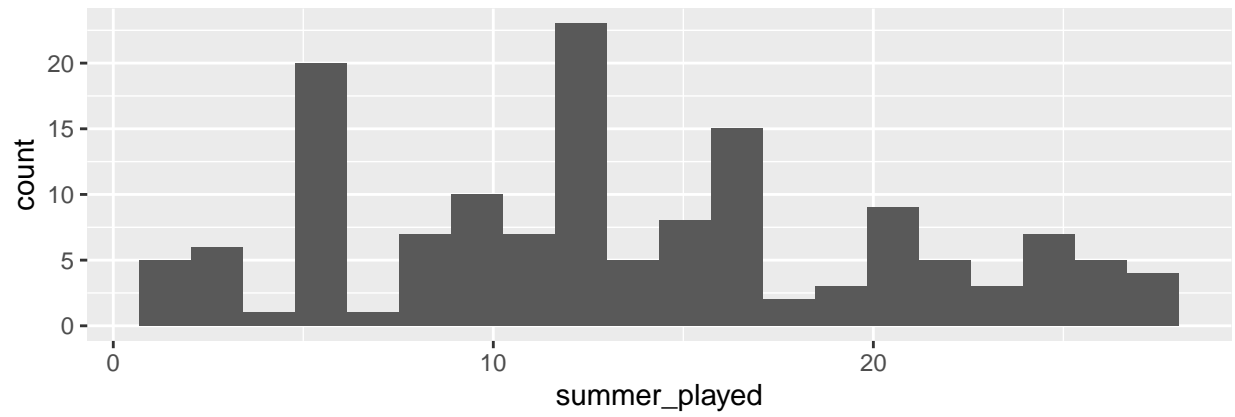
Question 4b

```
hist_winter_played <- swo %>%  
  ggplot(aes(winter_played)) +  
  geom_histogram(bins = 20)  
hist_winter_played
```



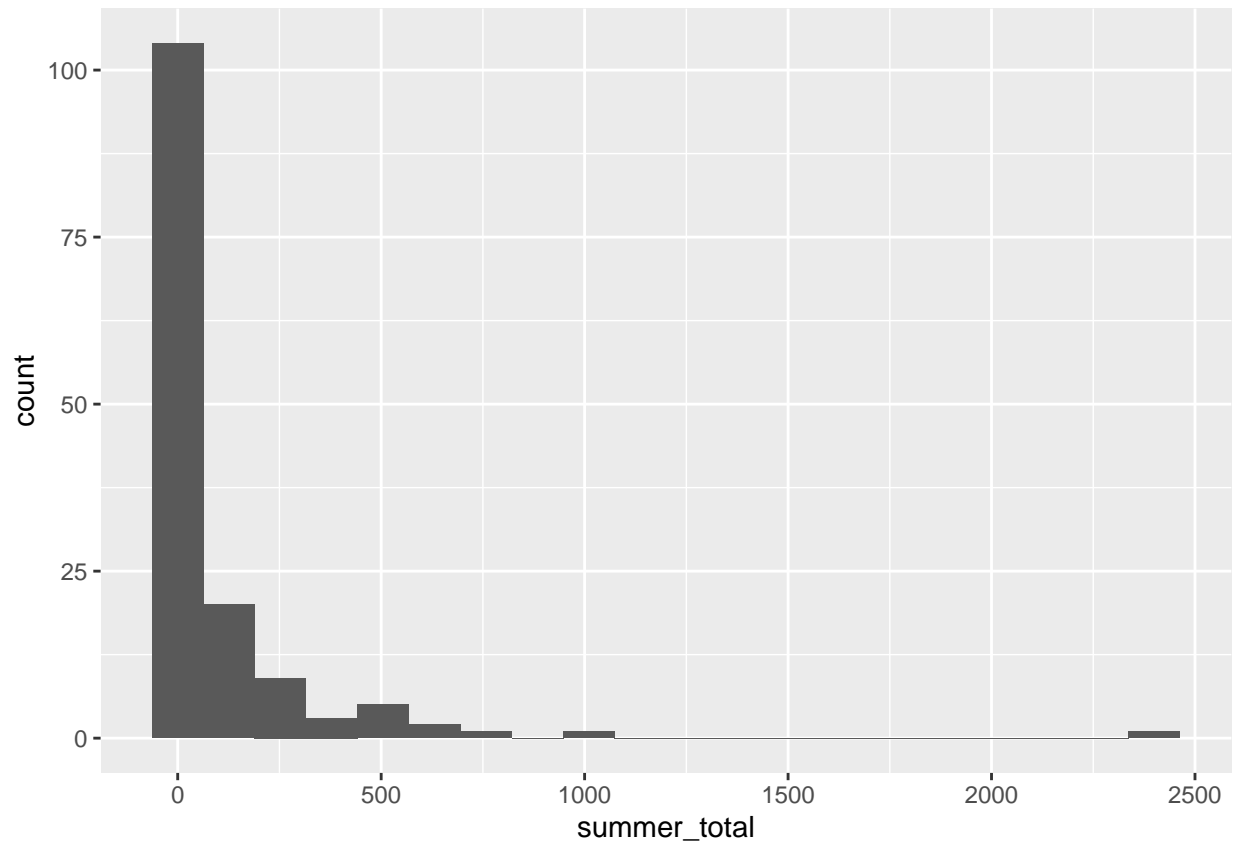
Question 4c

```
grid.arrange(hist_summer_played, hist_winter_played)
```

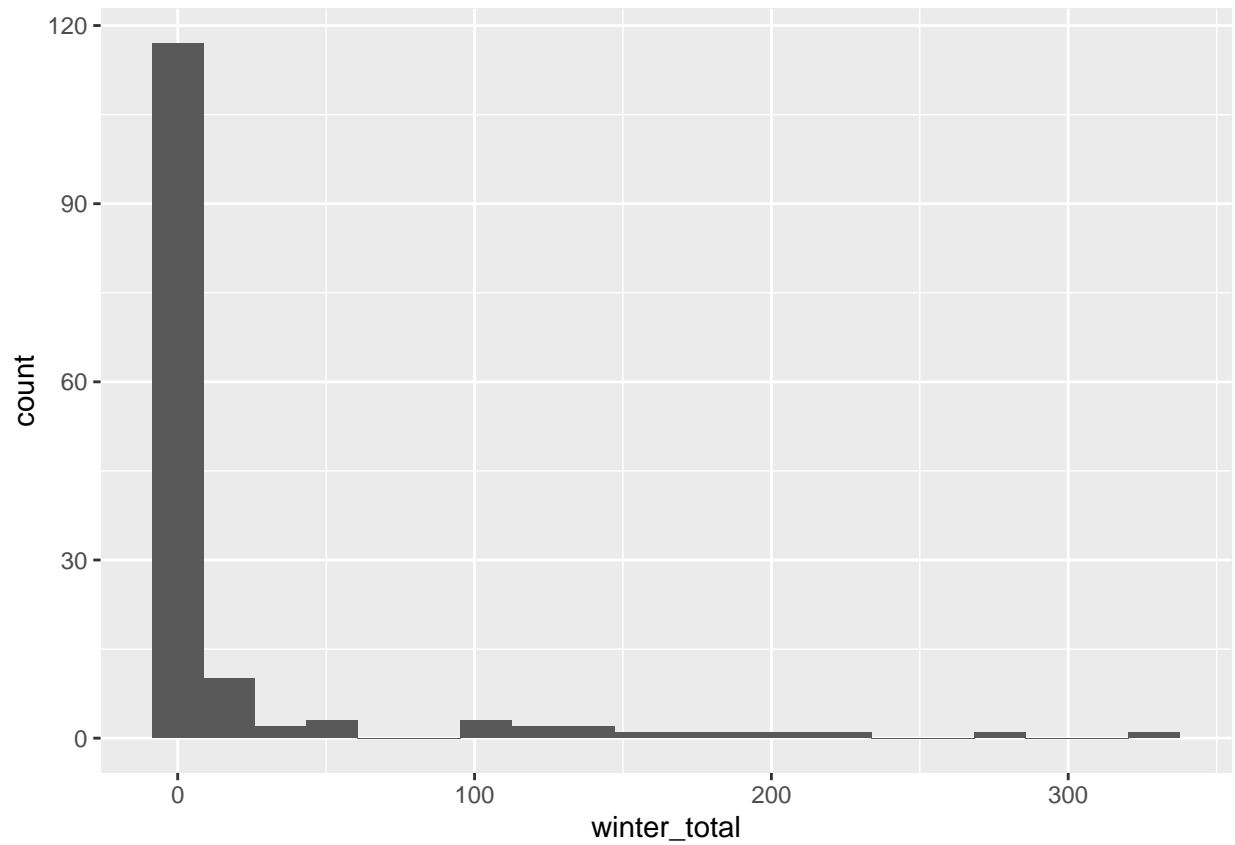


Question 4d

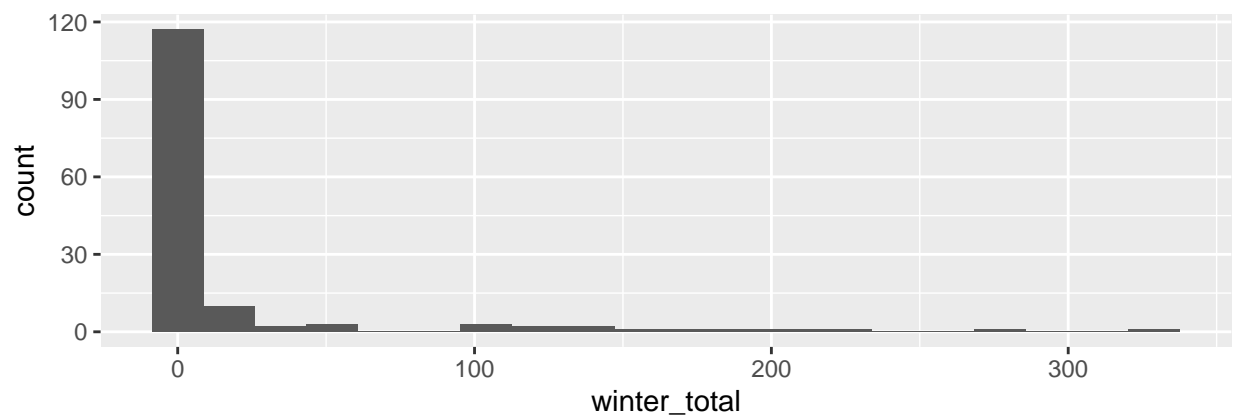
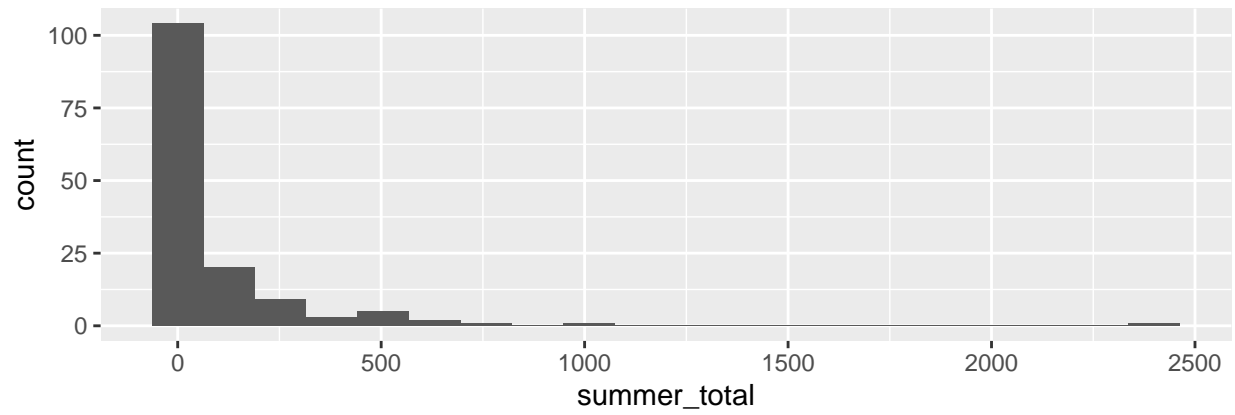
```
hist_summer_total <- swo %>%
  ggplot(aes(summer_total)) +
  geom_histogram(bins = 20)
hist_summer_total
```

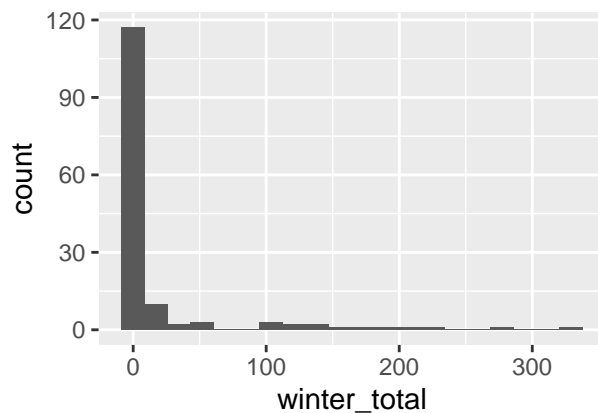
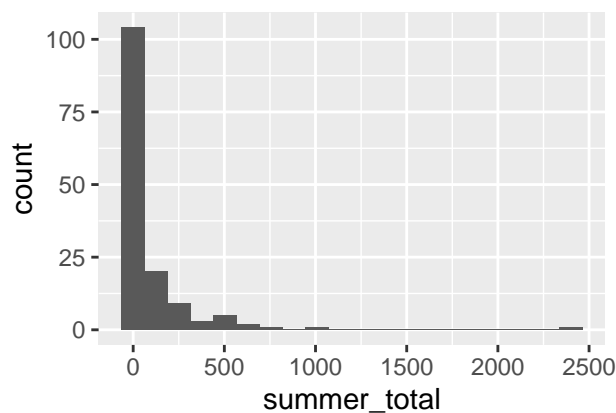
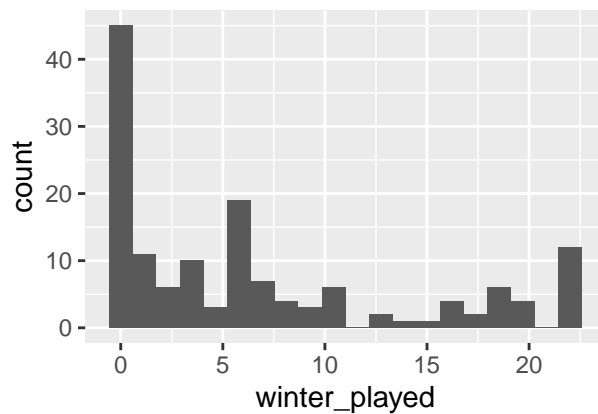
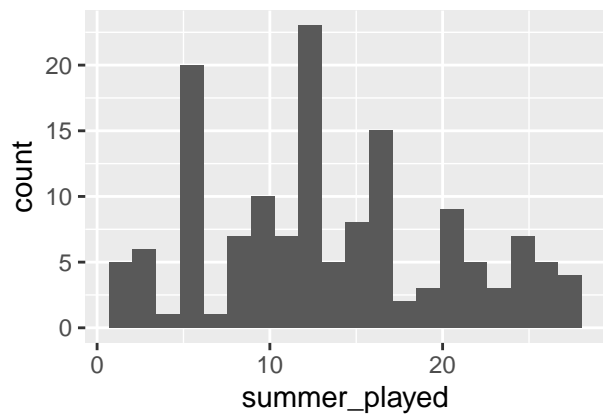
```
hist_winter_total <- swo %>%  
  ggplot(aes(winter_total)) +  
  geom_histogram(bins = 20)  
hist_winter_total
```



```
grid.arrange(hist_summer_total, hist_winter_total)
```



```
grid.arrange(  
  hist_summer_played, hist_winter_played,  
  hist_summer_total, hist_winter_total  
)
```



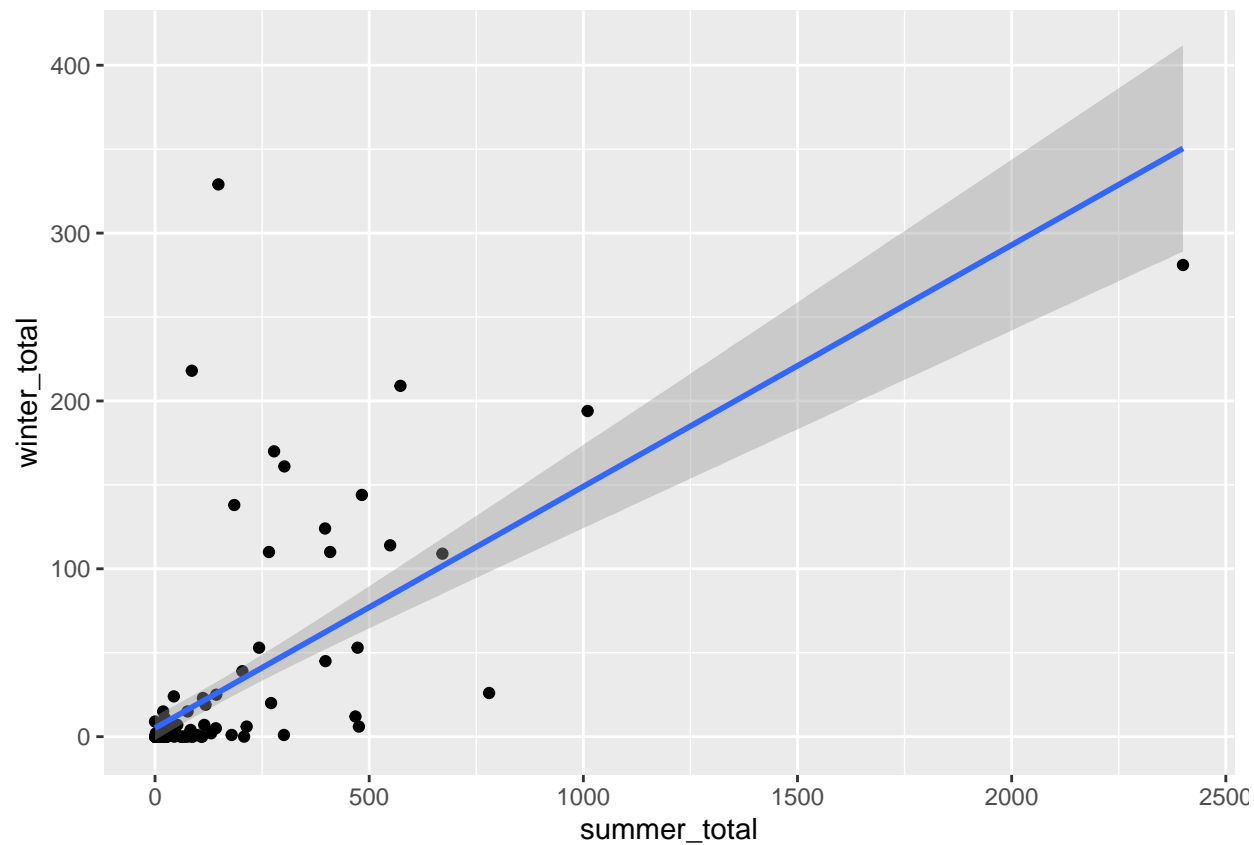
Question 4e

```
print(
  paste(
    "The correlation between total number of",
    "medals won in summer and in winter is:",
    cor(swo$summer_total, swo$winter_total)
  )
)
```

```
## [1] "The correlation between total number of medals won in summer and in winter is: 0.666063927423379"
```

```
swo %>%
  ggplot(aes(summer_total, winter_total)) +
  geom_point() +
  stat_smooth(method = "lm")
```

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



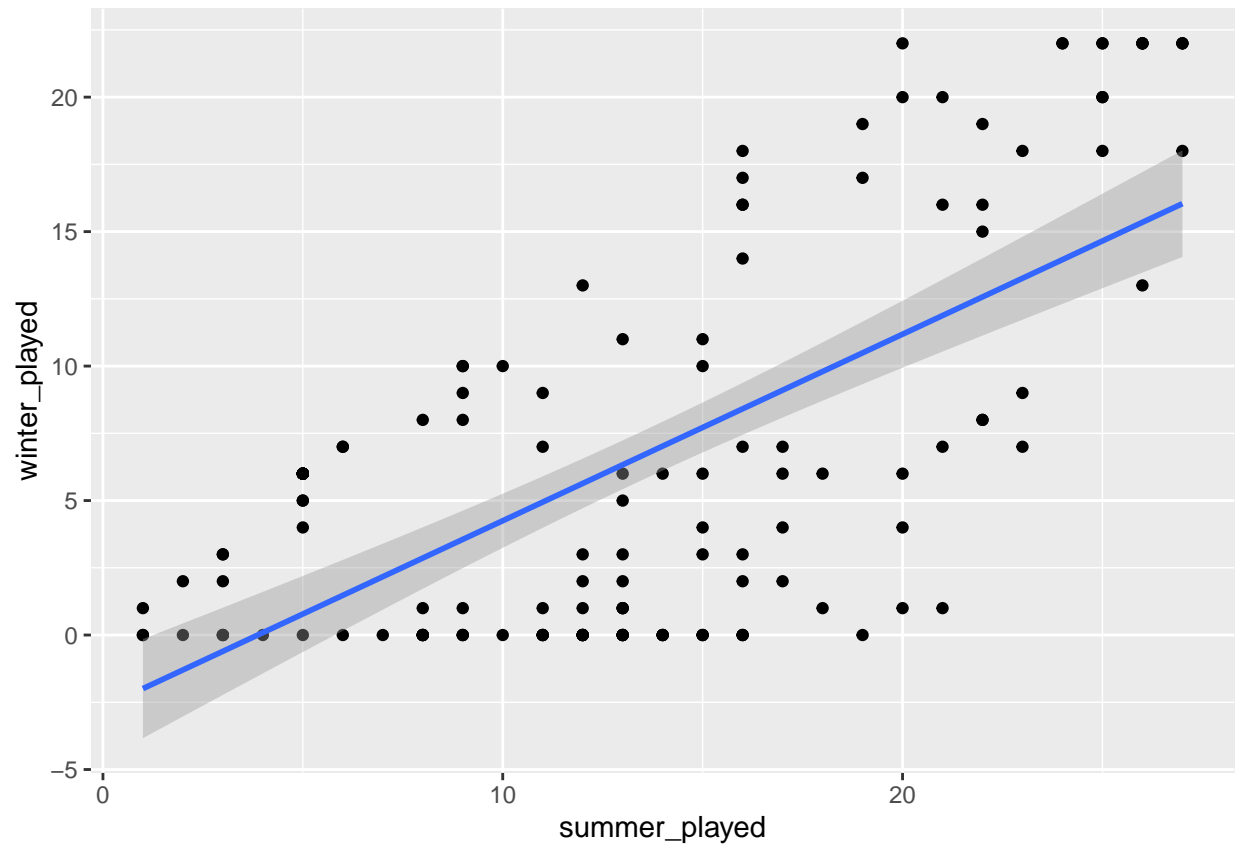
Question 4f

```
print(
  paste(
    "The correlation between total number of",
    "games played in summer and in winter is:",
    cor(swo$summer_played, swo$winter_played)
  )
)
```

```
## [1] "The correlation between total number of games played in summer and in winter is: 0.661184613384"
```

```
swo %>%
  ggplot(aes(summer_played, winter_played)) +
  geom_point() +
  stat_smooth(method = "lm")
```

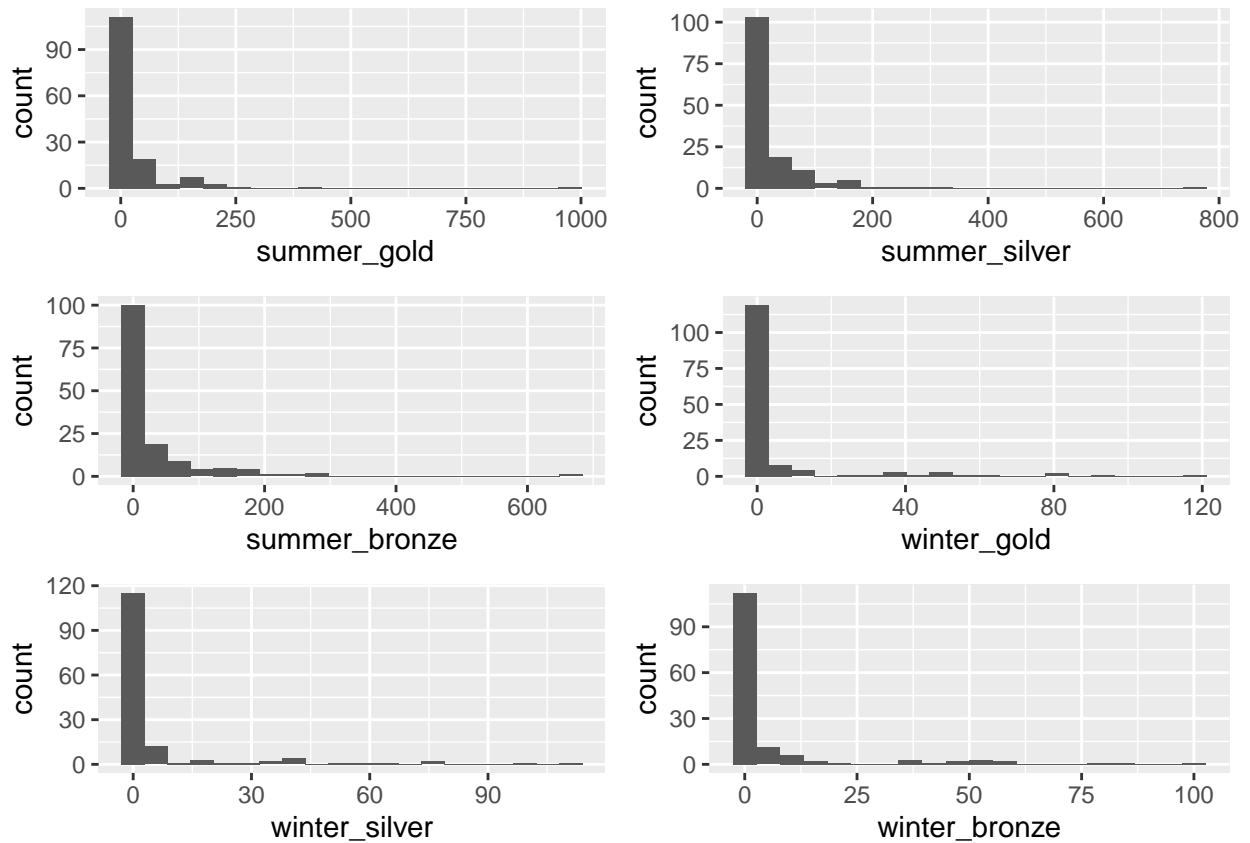
```
## `geom_smooth()` using formula 'y ~ x'
```



Question 4g

```
hist_summer_gold <- swo %>% ggplot(aes(summer_gold)) +
  geom_histogram(bins = 20)
hist_summer_silver <- swo %>% ggplot(aes(summer_silver)) +
  geom_histogram(bins = 20)
hist_summer_bronze <- swo %>% ggplot(aes(summer_bronze)) +
  geom_histogram(bins = 20)
hist_winter_gold <- swo %>% ggplot(aes(winter_gold)) +
  geom_histogram(bins = 20)
hist_winter_silver <- swo %>% ggplot(aes(winter_silver)) +
  geom_histogram(bins = 20)
hist_winter_bronze <- swo %>% ggplot(aes(winter_bronze)) +
  geom_histogram(bins = 20)

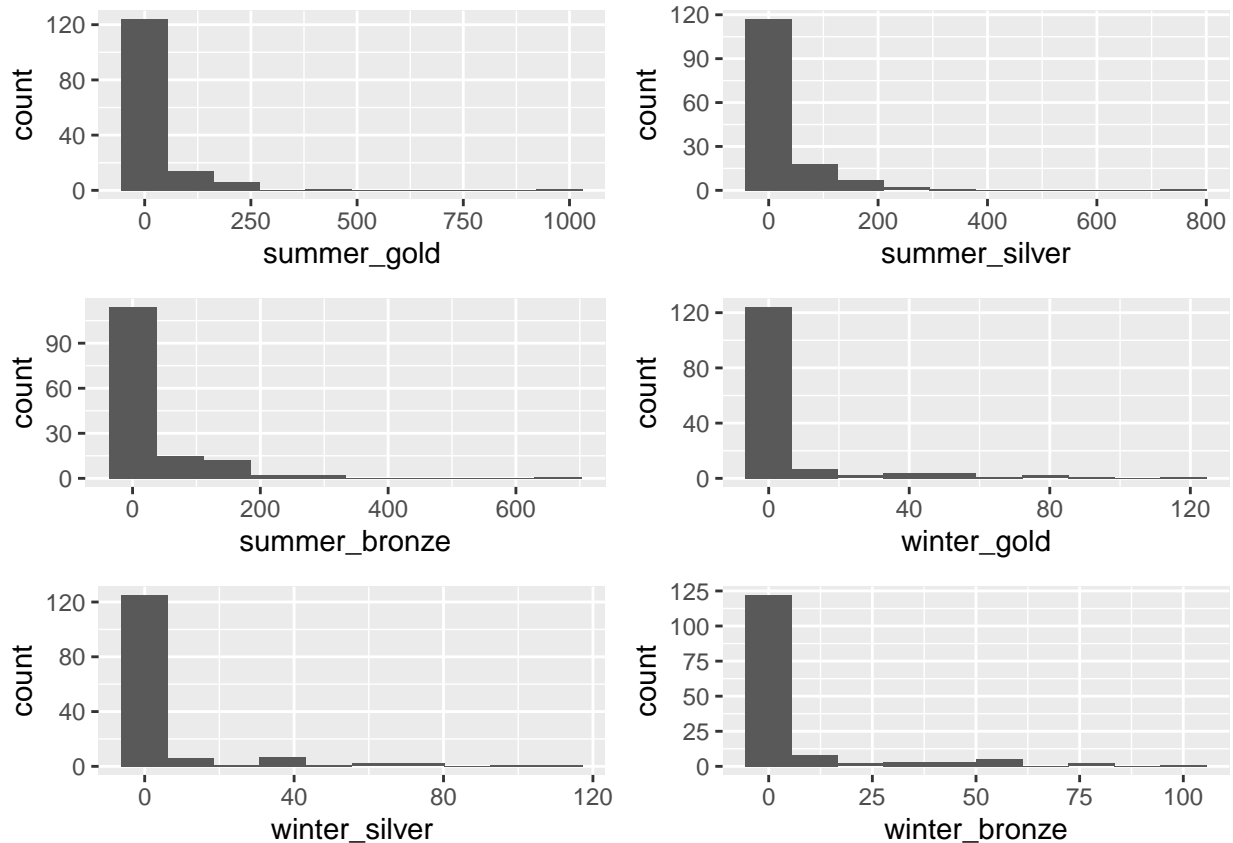
grid.arrange(
  hist_summer_gold,
  hist_summer_silver,
  hist_summer_bronze,
  hist_winter_gold,
  hist_winter_silver,
  hist_winter_bronze
)
```



Question 4h

```
hist_summer_gold <- swo %>% ggplot(aes(summer_gold)) +
  geom_histogram(bins = 10)
hist_summer_silver <- swo %>% ggplot(aes(summer_silver)) +
  geom_histogram(bins = 10)
hist_summer_bronze <- swo %>% ggplot(aes(summer_bronze)) +
  geom_histogram(bins = 10)
hist_winter_gold <- swo %>% ggplot(aes(winter_gold)) +
  geom_histogram(bins = 10)
hist_winter_silver <- swo %>% ggplot(aes(winter_silver)) +
  geom_histogram(bins = 10)
hist_winter_bronze <- swo %>% ggplot(aes(winter_bronze)) +
  geom_histogram(bins = 10)

grid.arrange(
  hist_summer_gold,
  hist_summer_silver,
  hist_summer_bronze,
  hist_winter_gold,
  hist_winter_silver,
  hist_winter_bronze
)
```



Question 4i

```
library(ggcorrplot)

# install.packages("GGally")
library(GGally)
```

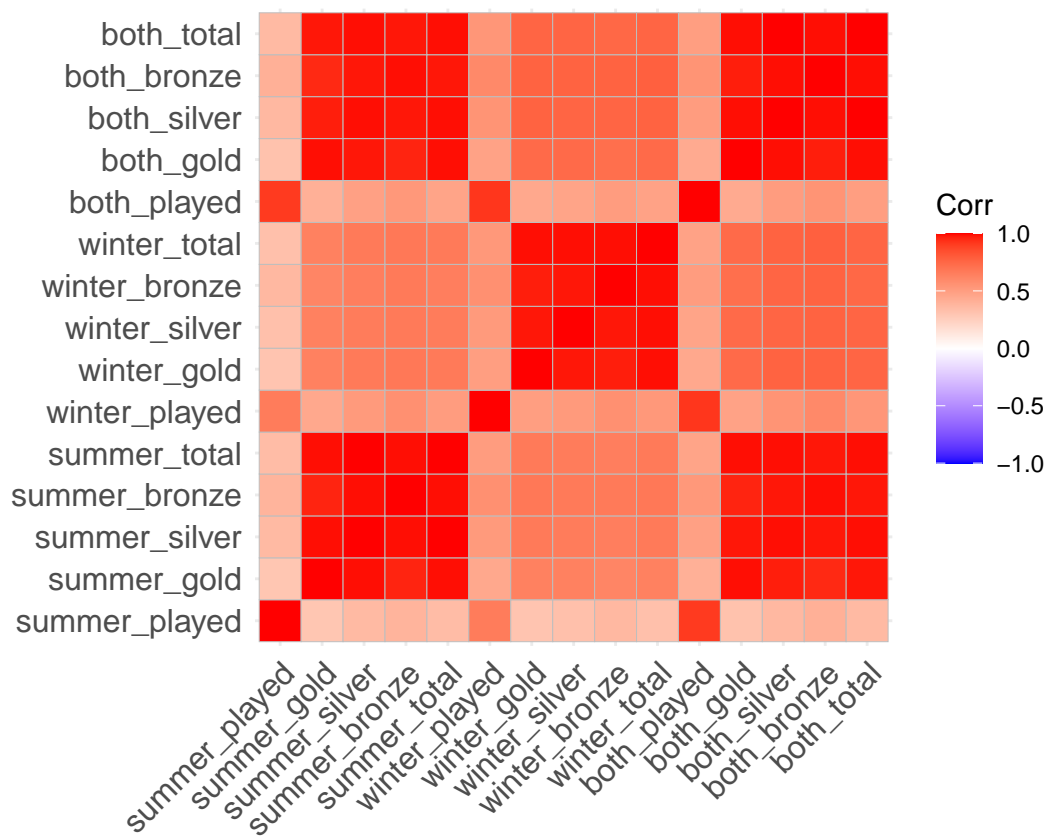
```
## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg   ggplot2
```

```
# install.packages("wordcloud")
library(wordcloud)
```

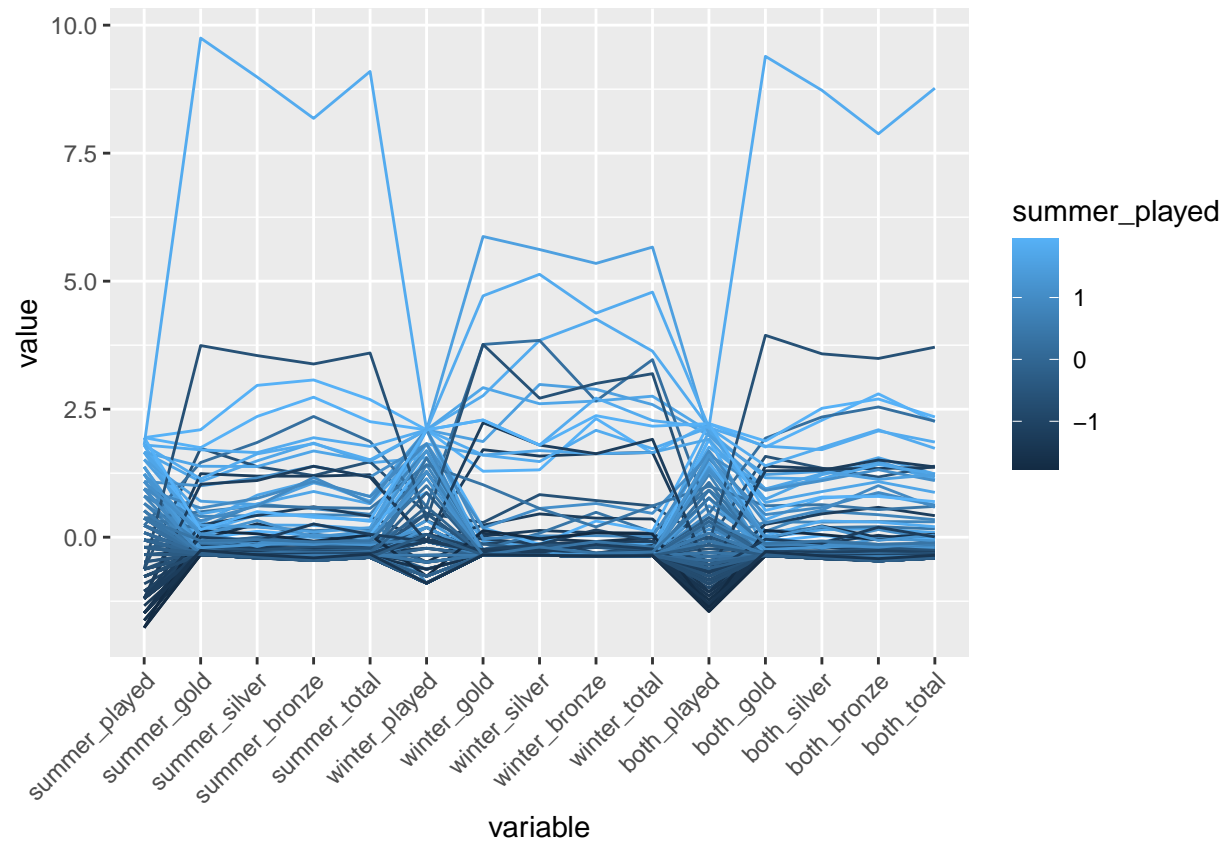
```
## Loading required package: RColorBrewer
```

```
numcol <- swo %>%
  colnames() %>%
  tail(-2)

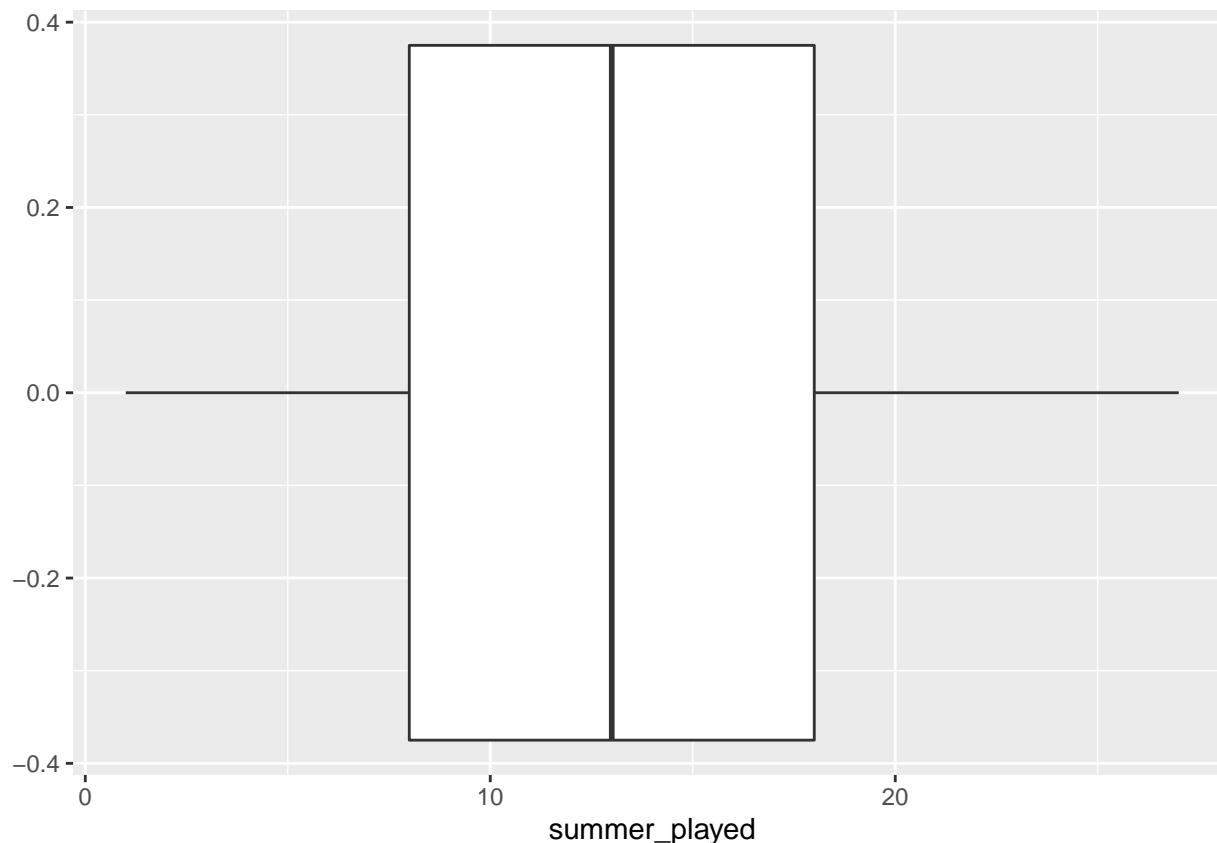
swo %>%
  select(all_of(numcol)) %>%
  cor() %>%
  ggcorrplot()
```

```
swo %>%
  ggparcoord(columns = 3:17, groupColumn = 3) +
  scale_x_discrete(guide = guide_axis(angle = 45))
```



```
swo %>% ggplot(aes(summer_played)) +  
  geom_boxplot()
```



```
wordcloud(
  swo$NOC,
  swo$summer_played,
  max.words = 50,
  rot.per = .35,
  min.freq = 10,
  random.order = FALSE,
  colors = brewer.pal(8, "Dark2")
) # I tried, but the wordcloud doesn't seem to work well
```

```
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : France (FRA) could not be fit on page. It will not be plotted.

## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Great Britain (GBR) could not be fit on page. It will not be plotted.

## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Greece (GRE) could not be fit on page. It will not be plotted.

## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Switzerland (SUI) could not be fit on page. It will not be plotted.

## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Denmark (DEN) could not be fit on page. It will not be plotted.

## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Sweden (SWE) could not be fit on page. It will not be plotted.

## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
```

```

## 0.35, : United States (USA) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Australia (AUS) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Belgium (BEL) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Canada (CAN) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Hungary (HUN) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Netherlands (NED) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Finland (FIN) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Argentina (ARG) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : India (IND) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Portugal (POR) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Luxembourg (LUX) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : New Zealand (NZL) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Brazil (BRA) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Japan (JPN) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Turkey (TUR) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Ireland (IRL) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Philippines (PHI) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Poland (POL) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Romania (ROU) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Uruguay (URU) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Bulgaria (BUL) could not be fit on page. It will not be plotted.
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =
## 0.35, : Cuba (CUB) could not be fit on page. It will not be plotted.

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## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Colombia (COL) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : South Africa (RSA) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Bermuda (BER) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Peru (PER) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Puerto Rico (PUR) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Venezuela (VEN) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Czechoslovakia (TCH) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Guyana (GUY) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Jamaica (JAM) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Lebanon (LIB) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Liechtenstein (LIE) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Pakistan (PAK) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Panama (PAN) could not be fit on page. It will not be plotted.  
  
## Warning in wordcloud(swo$NOC, swo$summer_played, max.words = 50, rot.per =  
## 0.35, : Yugoslavia (YUG) could not be fit on page. It will not be plotted.
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Iceland (ISL)
Spain (ESP)
Chile (CHI)
Italy (ITA)
Austria (AUT)
Norway (NOR)
Mexico (MEX)
Egypt (EGY)