Unite Examples

Some Examples of spread, gather, unite, separate.

See the R Studio Data Wrangling Cheatsheet.

See the R Studio ggplot Cheatsheet.

```
library(tidyverse)
```

The examples from the cheatsheet.

```
mydata <- data_frame(
  a = 1:3,
  b = 4:6
)

mydata
```

```
## # A tibble: 3 x 2
##       a     b
##   <int> <int>
## 1     1     4
## 2     2     5
## 3     3     6
```

Arrange the data.

```
arrange(mydata, desc(a))
```

```
## # A tibble: 3 x 2
##       a     b
##   <int> <int>
## 1     3     6
## 2     2     5
## 3     1     4
```

Rename the data.

```
mydata <- rename(mydata, x = a, y = b)

mydata
```

```
## # A tibble: 3 x 2
##       x     y
##   <int> <int>
## 1     1     4
## 2     2     5
## 3     3     6
```

```
arrange(mydata, desc(x))
```

```
## # A tibble: 3 x 2
##       x     y
```

```
##   <int> <int>
## 1     3     6
## 2     2     5
## 3     1     4
```

```
mydata %>% mutate(x.prop = x/sum(x), x.cum.prop = cumsum(x)/sum(x), y.prop = y/sum(y), y.cum.prop = cums
  select(x, x.prop, x.cum.prop, y, y.prop, y.cum.prop)
```

```
## # A tibble: 3 x 6
##       x x.prop x.cum.prop     y y.prop y.cum.prop
##   <int>  <dbl>      <dbl> <int>  <dbl>      <dbl>
## 1     1  0.167      0.167     4  0.267      0.267
## 2     2  0.333      0.5       5  0.333      0.6
## 3     3  0.5        1         6  0.4        1
```

Example, page 27, Problem 2.2, Ott 3rd Edition

```
imports <- data_frame(
  Year = c(1979:1986),
  Import = c(17518,15491,19898,16663,17061,26171,23650,19650)
)

imports
```

```
## # A tibble: 8 x 2
##    Year Import
##   <int>  <dbl>
## 1  1979  17518
## 2  1980  15491
## 3  1981  19898
## 4  1982  16663
## 5  1983  17061
## 6  1984  26171
## 7  1985  23650
## 8  1986  19650
```

```
imports.wide <- spread(imports, key = Year, value = Import)
imports.wide
```

```
## # A tibble: 1 x 8
##   `1979` `1980` `1981` `1982` `1983` `1984` `1985` `1986`
##    <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
## 1  17518  15491  19898  16663  17061  26171  23650  19650
```

```
imports.narrow <- gather(imports.wide, key = "Year.New", value = Import.New)
imports.narrow
```

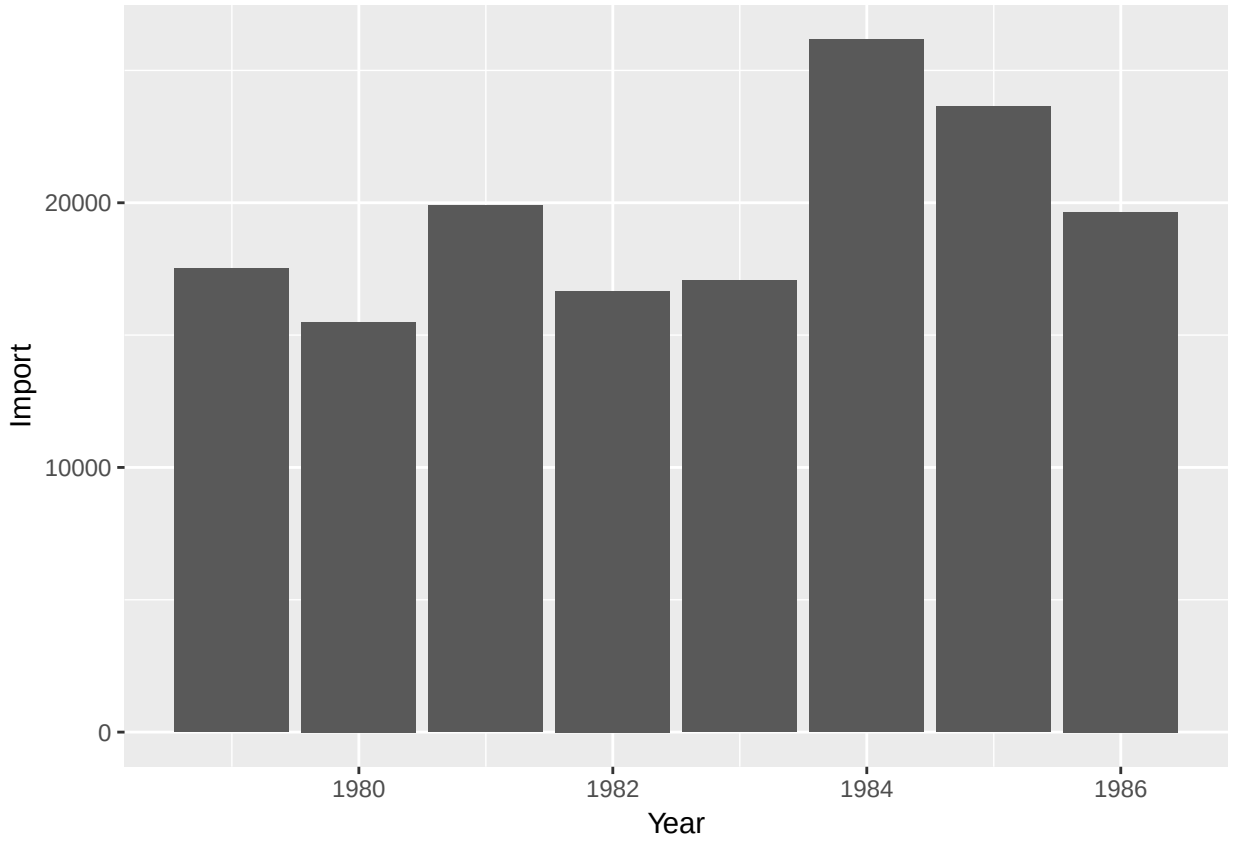
```
## # A tibble: 8 x 2
##   Year.New Import.New
##   <chr>         <dbl>
## 1 1979          17518
## 2 1980          15491
## 3 1981          19898
## 4 1982          16663
```

```
## 5 1983          17061
## 6 1984          26171
## 7 1985          23650
## 8 1986          19650
```

```
imports.narrow <- imports.narrow %>% mutate(Year.New = as.integer(Year.New))
imports.narrow
```

```
## # A tibble: 8 x 2
##   Year.New Import.New
##      <int>      <dbl>
## 1     1979      17518
## 2     1980      15491
## 3     1981      19898
## 4     1982      16663
## 5     1983      17061
## 6     1984      26171
## 7     1985      23650
## 8     1986      19650
```

```
imports %>% ggplot(aes(x=Year, y=Import)) +
  geom_col()
```




```
imports %>% ggplot(aes(x=Year, y=Import)) +
  geom_line()
```

Example, page 28, Problem 2.4, Ott 3rd Edition

```
GNP.1985 <- data_frame(
  Year = c(1985,1985,1985,1985),
  Quarter = c("I","II","III","IV"),
  GNP = c(3910,3961,4017,4067),
  DPI = c(2505,2532,2503,2533)
)
GNP.1985
```

```
## # A tibble: 4 x 4
##    Year Quarter   GNP   DPI
##   <dbl> <chr>   <dbl> <dbl>
## 1  1985 I        3910  2505
## 2  1985 II       3961  2532
## 3  1985 III      4017  2503
## 4  1985 IV       4067  2533
```

```
GNP.1986 <- data_frame(
  Year = c(1986,1986,1986,1986),
  Quarter = c("I","II","III","IV"),
  GNP = c(4137,4203,4266,4308),
  DPI = c(2536,2555,2579,2589)
)
GNP.1986
```

```
## # A tibble: 4 x 4
##    Year Quarter   GNP   DPI
##   <dbl> <chr>   <dbl> <dbl>
## 1  1986 I        4137  2536
## 2  1986 II       4203  2555
## 3  1986 III      4266  2579
## 4  1986 IV       4308  2589
```

```
GNP <- bind_rows(GNP.1985, GNP.1986)
GNP
```

```
## # A tibble: 8 x 4
##    Year Quarter   GNP   DPI
##   <dbl> <chr>   <dbl> <dbl>
## 1  1985 I        3910  2505
## 2  1985 II       3961  2532
## 3  1985 III      4017  2503
## 4  1985 IV       4067  2533
## 5  1986 I        4137  2536
## 6  1986 II       4203  2555
## 7  1986 III      4266  2579
## 8  1986 IV       4308  2589
```

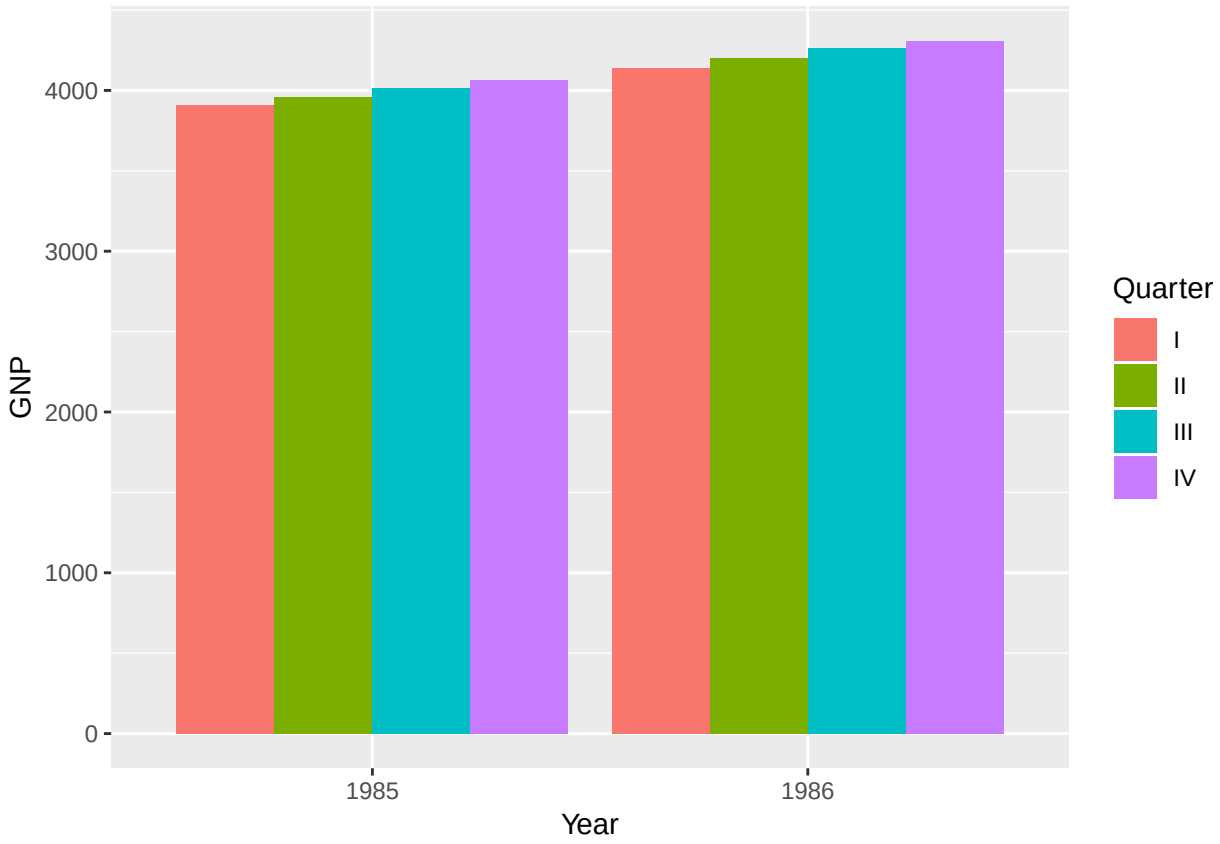
```
GNP.wide <- GNP %>% select(Year, Quarter, GNP) %>%
  spread(key = Quarter, value = GNP )
GNP.wide
```

```
## # A tibble: 2 x 5
##    Year     I    II   III    IV
##   <dbl> <dbl> <dbl> <dbl> <dbl>
## 1  1985  3910  3961  4017  4067
## 2  1986  4137  4203  4266  4308
```

```
GNP.narrow <- GNP.wide %>%
  gather(key = Quarter, value = GNP, I,II,III, IV ) %>%
  arrange(Year)
GNP.narrow
```

```
## # A tibble: 8 x 3
##    Year Quarter   GNP
##   <dbl> <chr>   <dbl>
## 1  1985 I        3910
## 2  1985 II       3961
## 3  1985 III      4017
## 4  1985 IV       4067
## 5  1986 I        4137
## 6  1986 II       4203
## 7  1986 III      4266
## 8  1986 IV       4308
```

```
GNP %>% ggplot(aes(x= factor(Year), y = GNP, fill = Quarter)) +
  geom_bar(stat = "identity", position = "dodge") +
  labs(x = "Year")
```



Example, page 30, Problem 2.14, Ott 3rd Edition

```
SAT <- data_frame(
  GT = c("Male, Math", "Female, Math", "Male, Verbal", "Female, Verbal"),
  "Year 1967" = c(514,467,463,486),
  "Year 1970" = c(509,465,459,461),
  "Year 1975" = c(495,449,437,431),
  "Year 1980" = c(491,443,428,420),
  "Year 1983" = c(493,445,430,420)
)
SAT
```

```
## # A tibble: 4 x 6
##   GT           `Year 1967` `Year 1970` `Year 1975` `Year 1980` `Year 1983`
##   <chr>              <dbl>       <dbl>       <dbl>       <dbl>       <dbl>
## 1 Male, Math           514         509         495         491         493
## 2 Female, Math         467         465         449         443         445
## 3 Male, Verbal         463         459         437         428         430
## 4 Female, Ver~         486         461         431         420         420
```

```
SAT.wide <- SAT %>% rename("1967" = "Year 1967", "1970" = "Year 1970", "1975" = "Year 1975", "1980" = "
SAT.wide
```

```
## # A tibble: 4 x 6
##   GT             `1967` `1970` `1975` `1980` `1983`
##   <chr>           <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
```

```
## 1 Male, Math        514    509    495    491    493
## 2 Female, Math      467    465    449    443    445
## 3 Male, Verbal      463    459    437    428    430
## 4 Female, Verbal    486    461    431    420    420
```

```
SAT.narrow <- SAT.wide %>% gather( key = Year, value = Score, "1967", "1970", "1975", "1980", "1983" )
SAT.narrow
```

```
## # A tibble: 20 x 3
##    GT             Year  Score
##    <chr>          <chr> <dbl>
##  1 Male, Math     1967    514
##  2 Female, Math   1967    467
##  3 Male, Verbal   1967    463
##  4 Female, Verbal 1967    486
##  5 Male, Math     1970    509
##  6 Female, Math   1970    465
##  7 Male, Verbal   1970    459
##  8 Female, Verbal 1970    461
##  9 Male, Math     1975    495
## 10 Female, Math   1975    449
## 11 Male, Verbal   1975    437
## 12 Female, Verbal 1975    431
## 13 Male, Math     1980    491
## 14 Female, Math   1980    443
## 15 Male, Verbal   1980    428
## 16 Female, Verbal 1980    420
## 17 Male, Math     1983    493
## 18 Female, Math   1983    445
## 19 Male, Verbal   1983    430
## 20 Female, Verbal 1983    420
```

```
SAT.narrow2 <- SAT.narrow %>% separate(GT, c("Gender", "Type"))
SAT.narrow2
```

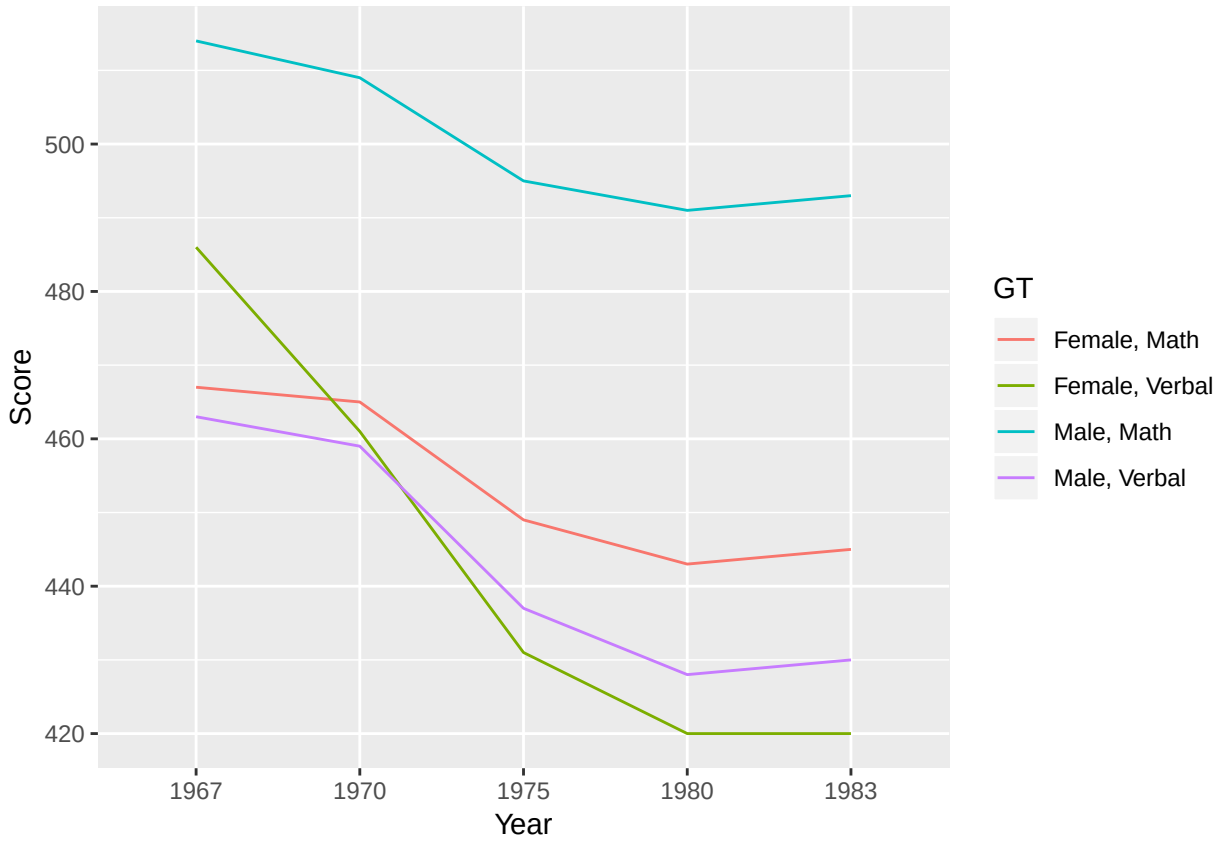
```
## # A tibble: 20 x 4
##    Gender Type   Year  Score
##    <chr>  <chr>  <chr> <dbl>
##  1 Male   Math   1967    514
##  2 Female Math   1967    467
##  3 Male   Verbal 1967    463
##  4 Female Verbal 1967    486
##  5 Male   Math   1970    509
##  6 Female Math   1970    465
##  7 Male   Verbal 1970    459
##  8 Female Verbal 1970    461
##  9 Male   Math   1975    495
## 10 Female Math   1975    449
## 11 Male   Verbal 1975    437
## 12 Female Verbal 1975    431
## 13 Male   Math   1980    491
## 14 Female Math   1980    443
## 15 Male   Verbal 1980    428
## 16 Female Verbal 1980    420
## 17 Male   Math   1983    493
## 18 Female Math   1983    445
```

```
## 19 Male   Verbal 1983    430
## 20 Female Verbal 1983    420
```

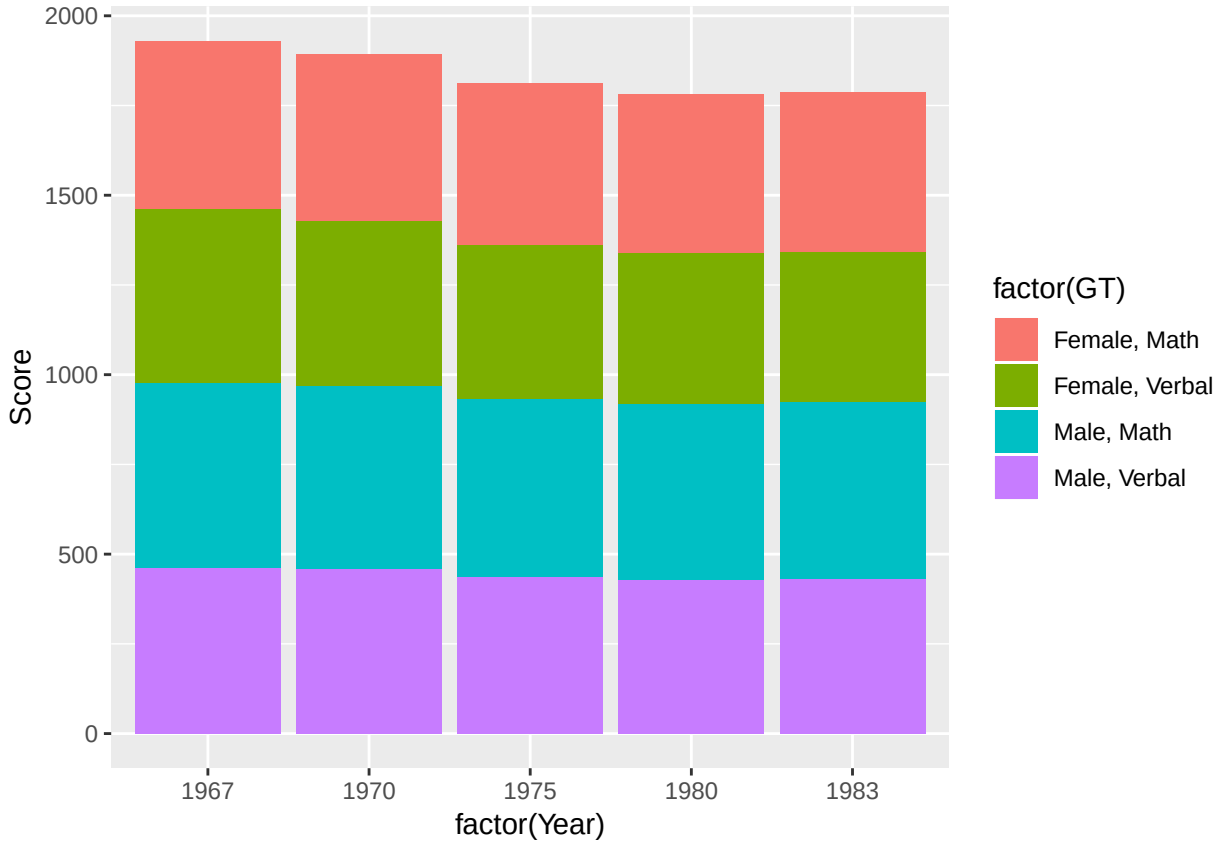
```
SAT.narrow3 <- SAT.narrow2 %>% unite(GT, c("Gender", "Type"), sep="_")
SAT.narrow3
```

```
## # A tibble: 20 x 3
##    GT            Year  Score
##    <chr>         <chr> <dbl>
##  1 Male_Math     1967    514
##  2 Female_Math   1967    467
##  3 Male_Verbal   1967    463
##  4 Female_Verbal 1967    486
##  5 Male_Math     1970    509
##  6 Female_Math   1970    465
##  7 Male_Verbal   1970    459
##  8 Female_Verbal 1970    461
##  9 Male_Math     1975    495
## 10 Female_Math   1975    449
## 11 Male_Verbal   1975    437
## 12 Female_Verbal 1975    431
## 13 Male_Math     1980    491
## 14 Female_Math   1980    443
## 15 Male_Verbal   1980    428
## 16 Female_Verbal 1980    420
## 17 Male_Math     1983    493
## 18 Female_Math   1983    445
## 19 Male_Verbal   1983    430
## 20 Female_Verbal 1983    420
```

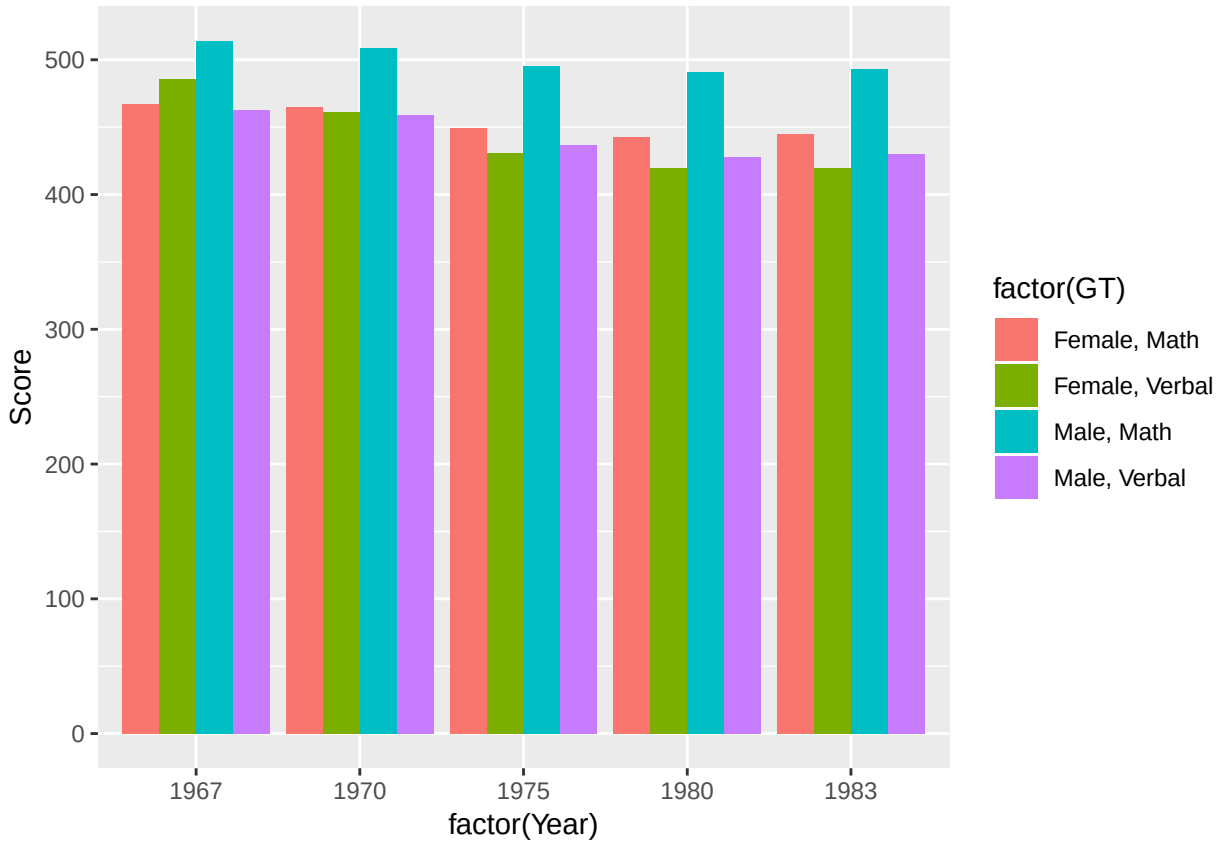
```
SAT.narrow %>% ggplot(aes(x=Year, y=Score, color=GT) ) +
  geom_line(aes(group = GT))
```




```
SAT.narrow %>% ggplot( aes( x=factor(Year), y=Score, fill=factor(GT) ) ) +
  geom_col()
```




```
SAT.narrow %>% ggplot( aes( x=factor(Year), y=Score, fill=factor(GT) ) ) +
  geom_col(position = "dodge")
```


500
400
300
200
100
0
Score
1967
1970
1975
1980
1983
factor(Year)
factor(GT)
Female, Math
Female, Verbal
Male, Math
Male, Verbal