Project 1 - Part 1

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```
# Annually is SC_Frequency_ID == "3"

Oats <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Prices"
         & SC_Commodity_Desc == "Oats") %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Corn <- FeedGrains %>%
  # Filter the Annual price for Corn and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Prices"
         & SC_Commodity_Desc == "Corn") %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Barley <- FeedGrains %>%
  # Filter the Annual price for Barley and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Prices"
         & SC_Commodity_Desc == "Barley") %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Sorghum <- FeedGrains %>%
  # Filter the Annual price for Sorghum and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Prices"
         & SC_Commodity_Desc == "Sorghum") %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)
# Joining all of the data tables
Oat_Bar = full_join(Oats, Barley)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)`
```

```
Oat_Bar
```

```
## # A tibble: 316 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc         Amount
##    <chr>               <dbl> <chr>              <chr>                      <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
```

```
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 306 more rows
```

```
Corn_Oat_Bar = full_join(Oat_Bar, Corn)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)`
```

```
Corn_Oat_Bar
```

```
## # A tibble: 474 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc          Amount
##    <chr>               <dbl> <chr>              <chr>                       <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 464 more rows
```

```
Full_feed_grains = full_join(Corn_Oat_Bar, Sorghum)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)`
```

```
Full_feed_grains
```

```
## # A tibble: 684 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc          Amount
##    <chr>               <dbl> <chr>              <chr>                       <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 674 more rows
```

```r
Oats2 <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Exports and imports"
         & SC_Commodity_Desc == "Oats" & SC_Unit_Desc == "1,000 metric tons" &
           SC_Attribute_ID == 24 & SC_Geography_ID == 25) %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Corn2 <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Exports and imports"
         & SC_Commodity_Desc == "Corn" & SC_Unit_Desc == "1,000 metric tons" &
           SC_Attribute_ID == 24 & SC_Geography_ID == 25) %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Barley2 <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Exports and imports"
         & SC_Commodity_Desc == "Barley" & SC_Unit_Desc == "1,000 metric tons" &
           SC_Attribute_ID == 24 & SC_Geography_ID == 25) %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Sorghum2 <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Exports and imports"
         & SC_Commodity_Desc == "Sorghum" & SC_Unit_Desc == "1,000 metric tons" &
           SC_Attribute_ID == 24 & SC_Geography_ID == 25) %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)
# Joining all of the data tables
Full_feed_grains2 = full_join(Full_feed_grains, Oats2)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)`
```

```r
Full_feed_grains2
```

```
## # A tibble: 719 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc         Amount
##    <chr>               <dbl> <chr>              <chr>                      <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 709 more rows
```

```r
Full_feed_grains2 = full_join(Full_feed_grains2, Corn2)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)`
```

```r
Full_feed_grains2
```

```
## # A tibble: 753 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc         Amount
##    <chr>               <dbl> <chr>              <chr>                      <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 743 more rows
```

```r
Full_feed_grains2 = full_join(Full_feed_grains2, Barley2)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)`
```

```r
Full_feed_grains2
```

```
## # A tibble: 788 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc         Amount
##    <chr>               <dbl> <chr>              <chr>                      <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 778 more rows
```

```r
Full_feed_grains = full_join(Full_feed_grains2, Sorghum2)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)`
```

```
Full_feed_grains
```

```
## # A tibble: 822 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc         Amount
##    <chr>               <dbl> <chr>              <chr>                      <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 812 more rows
```

```
Oats3 <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Exports and imports"
         & SC_Commodity_Desc == "Oats" & SC_Unit_Desc == "1,000 metric tons" &
           SC_Attribute_ID == 19 & SC_Geography_ID == 25) %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Corn3 <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Exports and imports"
         & SC_Commodity_Desc == "Corn" & SC_Unit_Desc == "1,000 metric tons" &
           SC_Attribute_ID == 19 & SC_Geography_ID == 25) %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Barley3 <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Exports and imports"
         & SC_Commodity_Desc == "Barley" & SC_Unit_Desc == "1,000 metric tons" &
           SC_Attribute_ID == 19 & SC_Geography_ID == 25) %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

Sorghum3 <- FeedGrains %>%
  # Filter the prices annually for Oats and select year, commodity, price, and what the price goes by
  mutate(SC_Frequency_ID = as.character(SC_Frequency_ID)) %>%
  filter(SC_Frequency_ID == "3" & SC_Group_Desc == "Exports and imports"
         & SC_Commodity_Desc == "Sorghum" & SC_Unit_Desc == "1,000 metric tons" &
           SC_Attribute_ID == 19 & SC_Geography_ID == 25) %>%
  select(SC_Commodity_Desc, Year_ID, SC_Unit_Desc, SC_Attribute_Desc, Amount)

# Joining all of the data tables
Full_feed_grains2 = full_join(Full_feed_grains, Oats3)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
```

```
## SC_Attribute_Desc, Amount)‘
```

```
Full_feed_grains2
```

```
## # A tibble: 857 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc          Amount
##    <chr>               <dbl> <chr>              <chr>                       <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 847 more rows
```

```
Full_feed_grains2 = full_join(Full_feed_grains2, Corn3)
```

```
## Joining with ‘by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)‘
```

```
Full_feed_grains2
```

```
## # A tibble: 891 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc          Amount
##    <chr>               <dbl> <chr>              <chr>                       <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 881 more rows
```

```
Full_feed_grains2 = full_join(Full_feed_grains2, Barley3)
```

```
## Joining with ‘by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)‘
```

```
Full_feed_grains2
```

```
## # A tibble: 926 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc          Amount
```

```
##    <chr>               <dbl> <chr>              <chr>                       <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 916 more rows
```

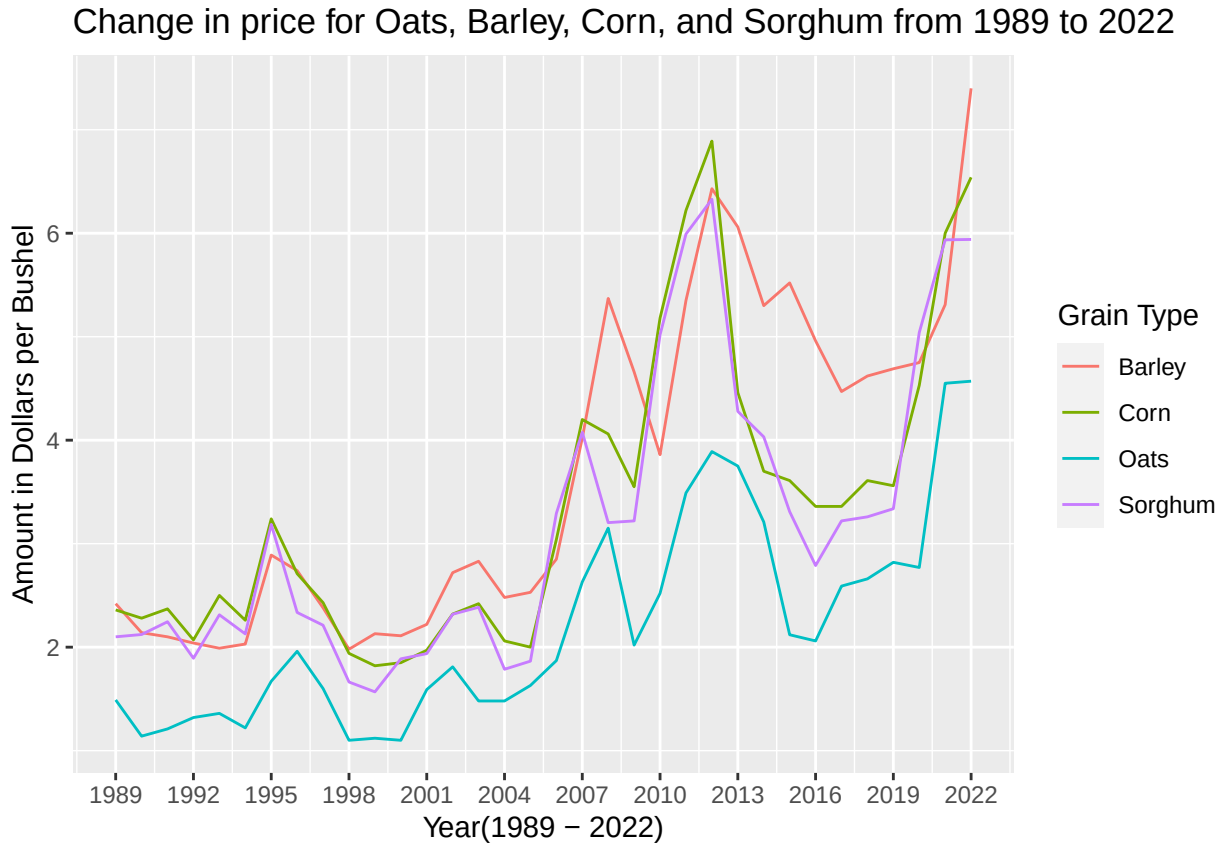
```
Full_feed_grains = full_join(Full_feed_grains2, Sorghum3)
```

```
## Joining with `by = join_by(SC_Commodity_Desc, Year_ID, SC_Unit_Desc,
## SC_Attribute_Desc, Amount)`
```

```
Full_feed_grains
```

```
## # A tibble: 960 x 5
##    SC_Commodity_Desc Year_ID SC_Unit_Desc       SC_Attribute_Desc          Amount
##    <chr>               <dbl> <chr>              <chr>                       <dbl>
##  1 Oats                 1966 Dollars per bushel Prices received by farme~  0.666
##  2 Oats                 1967 Dollars per bushel Prices received by farme~  0.659
##  3 Oats                 1968 Dollars per bushel Prices received by farme~  0.598
##  4 Oats                 1969 Dollars per bushel Prices received by farme~  0.584
##  5 Oats                 1970 Dollars per bushel Prices received by farme~  0.623
##  6 Oats                 1971 Dollars per bushel Prices received by farme~  0.604
##  7 Oats                 1972 Dollars per bushel Prices received by farme~  0.724
##  8 Oats                 1973 Dollars per bushel Prices received by farme~  1.18
##  9 Oats                 1974 Dollars per bushel Prices received by farme~  1.53
## 10 Oats                 1975 Dollars per bushel Prices received by farme~  1.45
## # i 950 more rows
```

```
# Making the line graphs for prices
Full_feed_grains %>%
  filter(SC_Unit_Desc == "Dollars per bushel") %>%
  filter(Year_ID >= 1989 & Year_ID <= 2022)%>%
  ggplot(aes(x = Year_ID, y = Amount,
             group = SC_Commodity_Desc,
             color = SC_Commodity_Desc)) +
  geom_line()+
  labs(title = "Change in price for Oats, Barley, Corn, and Sorghum from 1989 to 2022",
       x = "Year(1989 - 2022)",
       y = "Amount in Dollars per Bushel") +
  scale_x_continuous(breaks = seq(1989, 2022, by = 3), labels = seq(1989, 2022, by = 3)) +
  scale_color_discrete(name = "Grain Type")
```

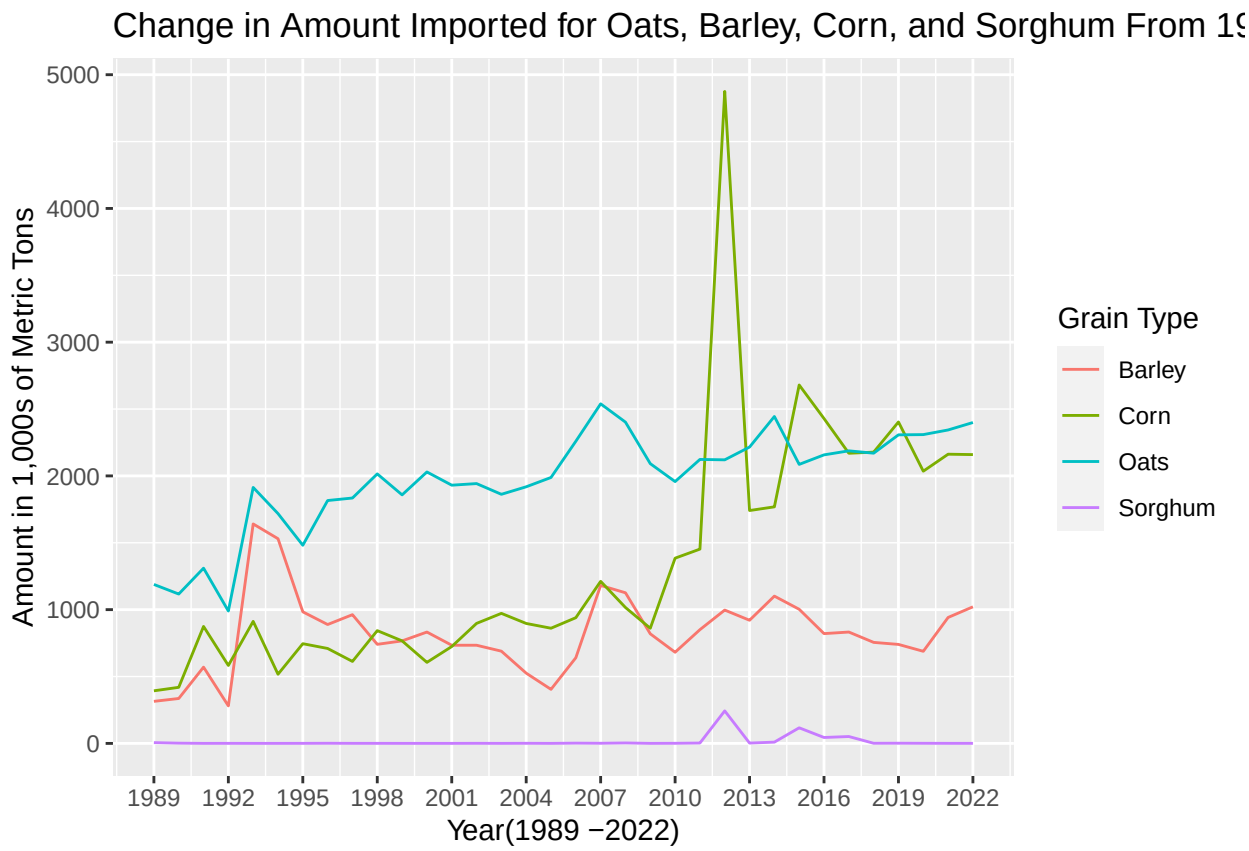



```
# Making the summary statistics for prices
Full_feed_grains %>%
  filter(SC_Unit_Desc == "Dollars per bushel" &
           Year_ID >= 1989 & Year_ID <= 2022)%>%
  group_by(SC_Commodity_Desc)%>%
  summarize(minimum = min(Amount),
            Q1 = quantile(Amount, .25),
            median = median(Amount),
            Q3 = quantile(Amount, .75),
            maximum = max(Amount),
            mean = mean(Amount),
            SD = sd(Amount),
            n = n(),
            Missing = sum((is.na(Amount))))
```

```
## # A tibble: 4 x 10
##   SC_Commodity_Desc minimum    Q1 median    Q3 maximum  mean    SD     n Missing
##   <chr>                <dbl> <dbl>  <dbl> <dbl>   <dbl> <dbl> <dbl> <int>   <int>
## 1 Barley                1.98  2.26   2.87  4.91    7.4   3.69 1.56     34       0
## 2 Corn                  1.82  2.29   3.14  3.97    6.89  3.37 1.43     34       0
## 3 Oats                  1.1   1.48   1.92  2.74    4.57  2.20 0.996    34       0
## 4 Sorghum               1.57  2.12   2.99  3.86    6.33  3.18 1.40     34       0
```

```
# Making the line graph for the imports
Full_feed_grains %>%
```

```
  filter(SC_Attribute_Desc == "Imports, to U.S. from specified source") %>%
  filter(Year_ID <= 2022)%>%
  ggplot(aes(x = Year_ID, y = Amount,
             group = SC_Commodity_Desc,
             color = SC_Commodity_Desc)) +
  geom_line()+
  labs(title = "Change in Amount Imported for Oats, Barley, Corn, and Sorghum From 1989 to 2022",
       x = "Year(1989 -2022)",
       y = "Amount in 1,000s of Metric Tons") +
  scale_x_continuous(breaks = seq(1989, 2022, by = 3), labels = seq(1989, 2022, by = 3)) +
  scale_color_discrete(name = "Grain Type")
```

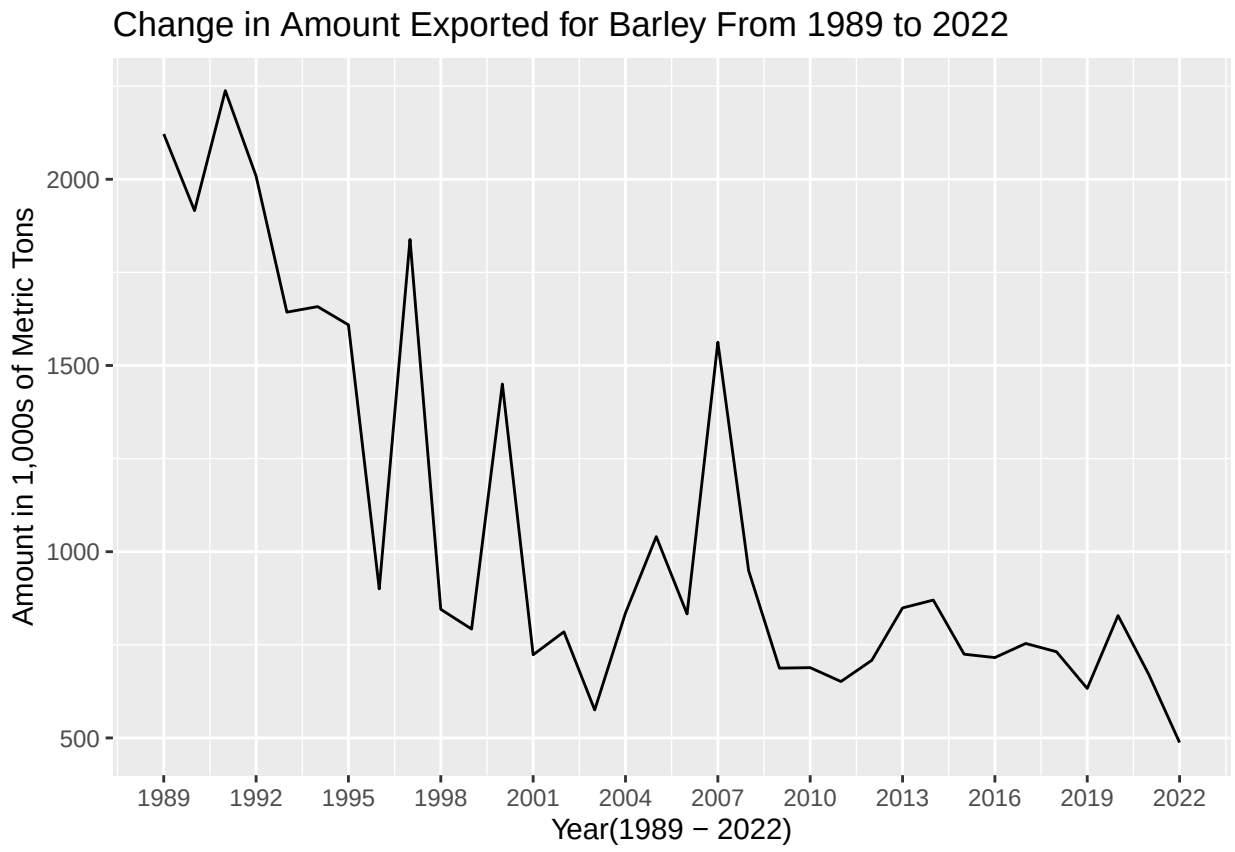



```
# Making the summary statistics for imports
Full_feed_grains %>%
  filter(SC_Attribute_Desc == "Imports, to U.S. from specified source" &
           Year_ID <= 2022)%>%
  group_by(SC_Commodity_Desc)%>%
  summarize(minimum = min(Amount),
            Q1 = quantile(Amount, .25),
            median = median(Amount),
            Q3 = quantile(Amount, .75),
            maximum = max(Amount),
            mean = mean(Amount),
            SD = sd(Amount),
            n = n(),
```

```
            Missing = sum((is.na(Amount))))
```

```
## # A tibble: 4 x 10
##   SC_Commodity_Desc   minimum       Q1  median     Q3 maximum   mean    SD     n
##   <chr>                 <dbl>    <dbl>   <dbl>  <dbl>   <dbl>  <dbl> <dbl> <int>
## 1 Barley            280.       689.    8.20e+2 9.78e2   1641.  825.  296.     34
## 2 Corn              393.       751.    9.26e+2 1.97e3   4875. 1347.  915.     34
## 3 Oats              990.      1859.    2.02e+3 2.21e3   2539. 1971.  379.     34
## 4 Sorghum             0.00463    0.201 6.92e-1 2.19e0    243.   14.5  46.2    34
## # i 1 more variable: Missing <int>
```

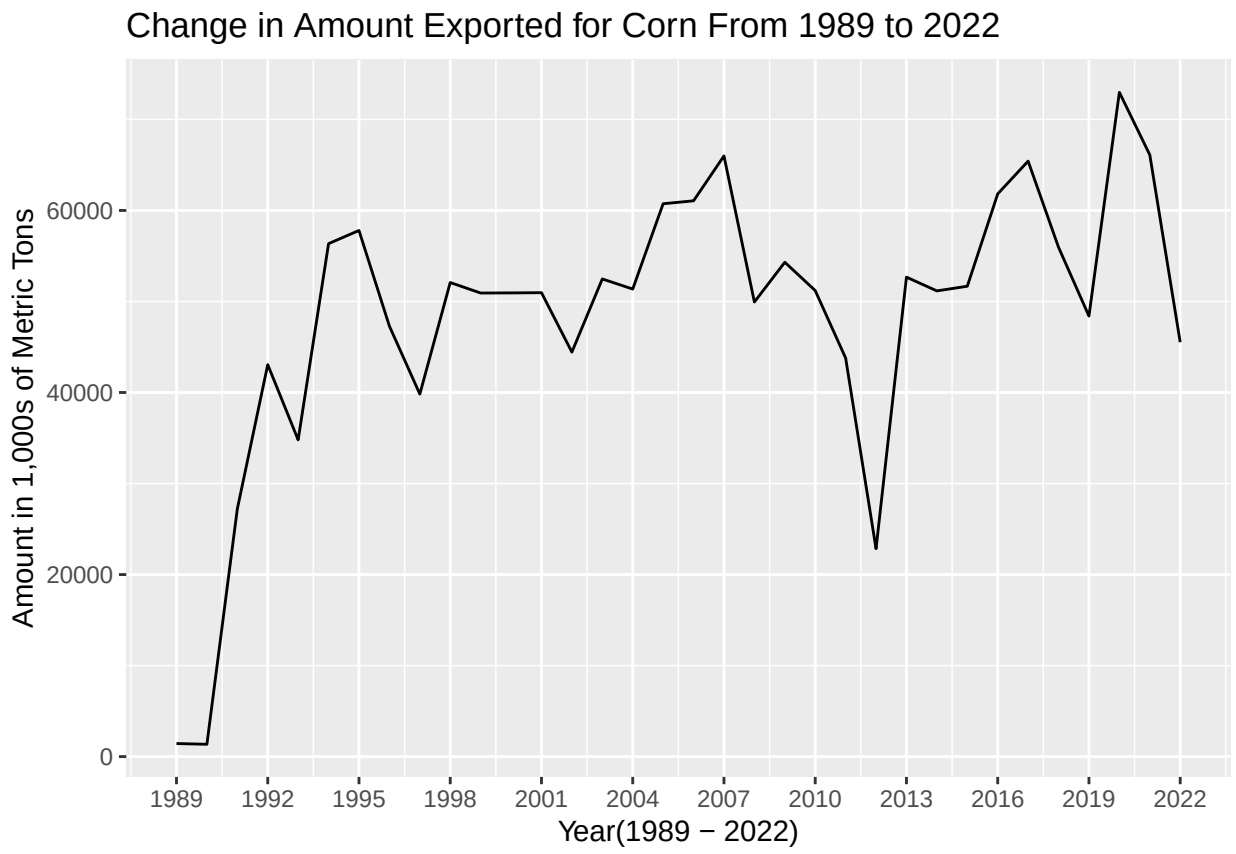
```
# Making the graph for Barley exports
Full_feed_grains %>%
  filter(SC_Attribute_Desc == "Exports, from U.S. to specified destination") %>%
  filter(Year_ID <= 2022 & SC_Commodity_Desc == "Barley")%>%
  ggplot(aes(x = Year_ID, y = Amount,
             group = SC_Commodity_Desc)) +
  geom_line()+
  labs(title = "Change in Amount Exported for Barley From 1989 to 2022 ",
       x = "Year(1989 - 2022)",
       y = "Amount in 1,000s of Metric Tons") +
  scale_x_continuous(breaks = seq(1989, 2022, by = 3), labels = seq(1989, 2022, by = 3)) +
    scale_color_discrete(name = "Grain Type")
```



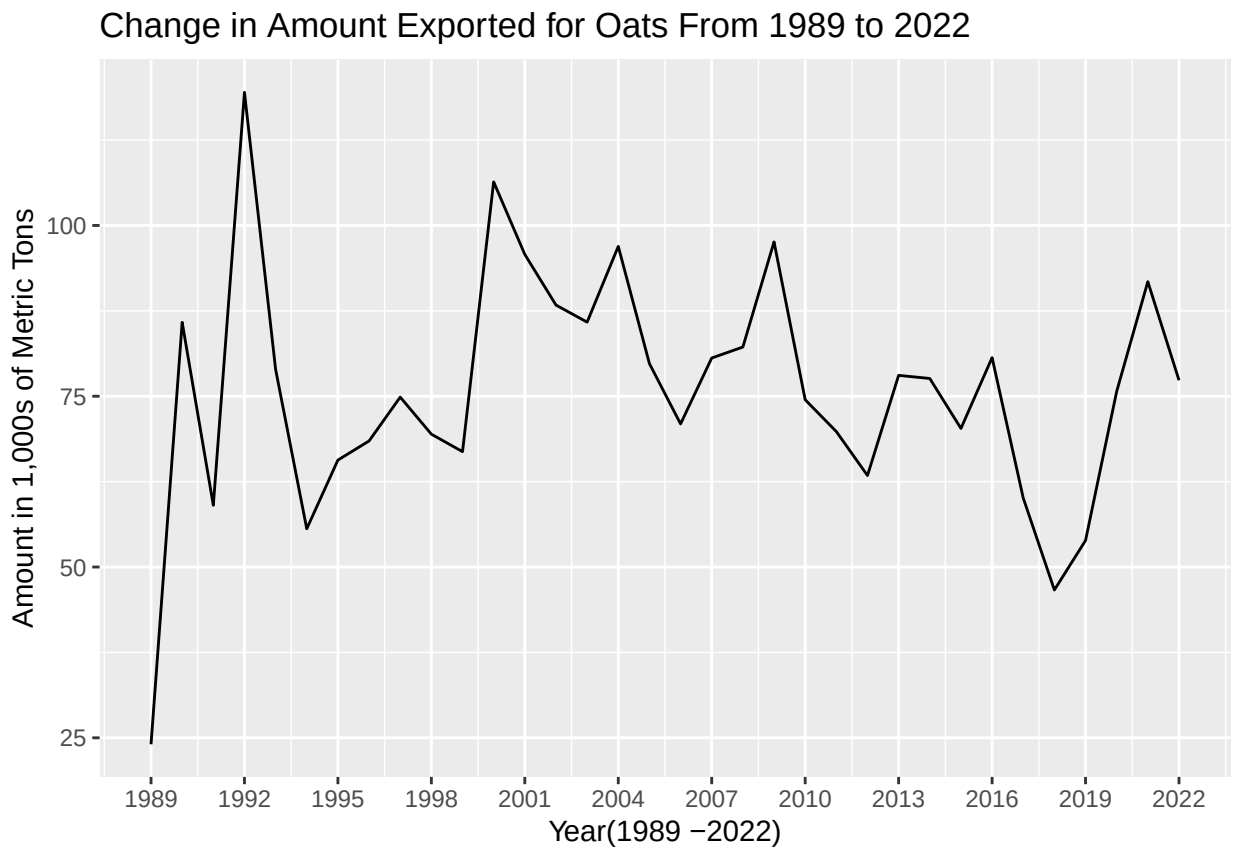
```r
# Making the summary statistics for all exports
Full_feed_grains %>%
  filter(SC_Attribute_Desc == "Exports, from U.S. to specified destination" &
           Year_ID <= 2022)%>%
  group_by(SC_Commodity_Desc)%>%
  summarize(minimum = min(Amount),
            Q1 = quantile(Amount, .25),
            median = median(Amount),
            Q3 = quantile(Amount, .75),
            maximum = max(Amount),
            mean = mean(Amount),
            SD = sd(Amount),
            n = n(),
            Missing = sum((is.na(Amount))))
```

```
## # A tibble: 4 x 10
##   SC_Commodity_Desc minimum      Q1  median      Q3 maximum    mean     SD     n
##   <chr>               <dbl>   <dbl>   <dbl>   <dbl>   <dbl>   <dbl>  <dbl> <int>
## 1 Barley              487.    718.    834.   1534.    2238.  1068.  5.11e2    34
## 2 Corn               1353.  44712.  51182.  56252.   72977. 48351.  1.58e4    34
## 3 Oats                 24.0    67.3    76.5    84.9    119.    75.7 1.77e1    34
## 4 Sorghum            1611.   4677.   5189.   6399.    8935.  5371.  1.76e3    34
## # i 1 more variable: Missing <int>
```

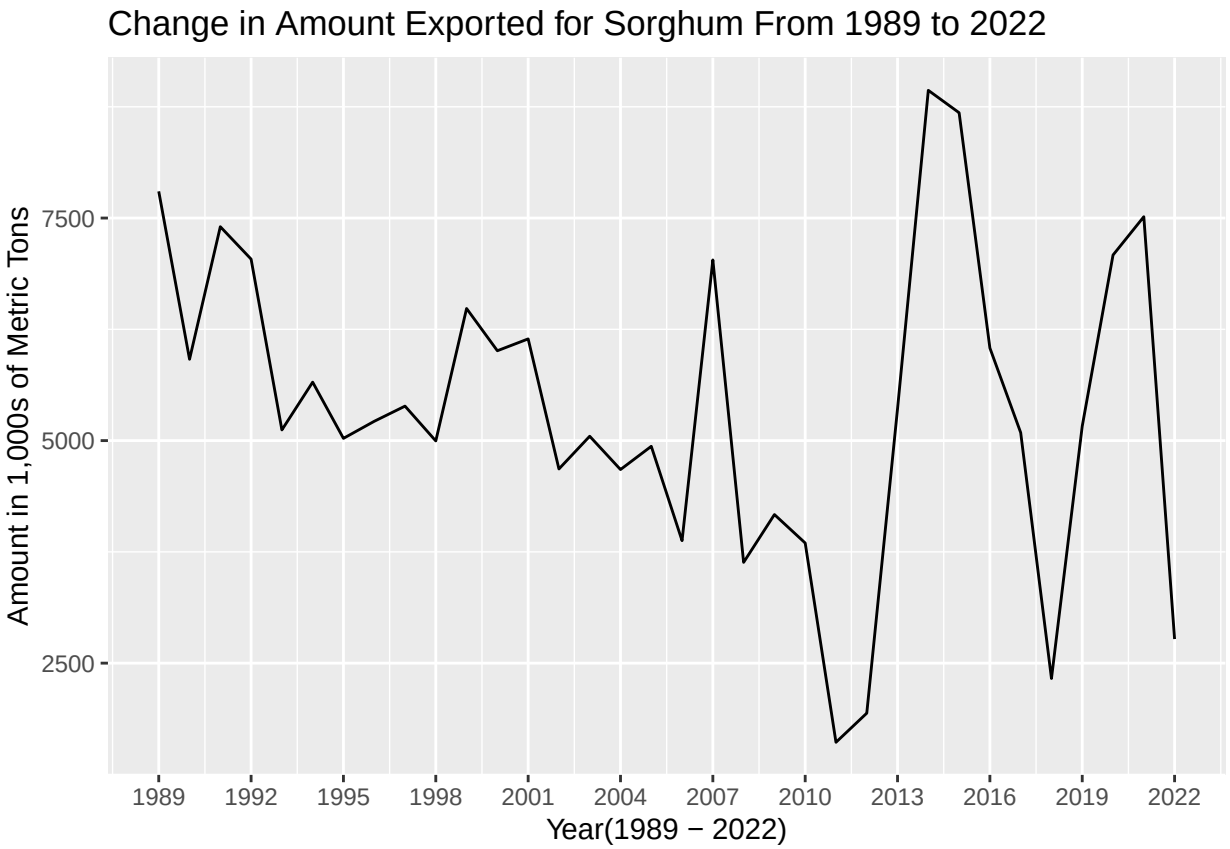
```r
# Making the graph for Corn exports
Full_feed_grains %>%
  filter(SC_Attribute_Desc == "Exports, from U.S. to specified destination") %>%
  filter(Year_ID <= 2022 & SC_Commodity_Desc == "Corn")%>%
  ggplot(aes(x = Year_ID, y = Amount,
             group = SC_Commodity_Desc,
             )) +
  geom_line()+
  labs(title = "Change in Amount Exported for Corn From 1989 to 2022 ",
       x = "Year(1989 - 2022)",
       y = "Amount in 1,000s of Metric Tons") +
  scale_x_continuous(breaks = seq(1989, 2022, by = 3), labels = seq(1989, 2022, by = 3)) +
    scale_color_discrete(name = "Grain Type")
```




```
# Making the graph for Oats exports
Full_feed_grains %>%
  filter(SC_Attribute_Desc == "Exports, from U.S. to specified destination") %>%
  filter(Year_ID <= 2022 & SC_Commodity_Desc == "Oats")%>%
  ggplot(aes(x = Year_ID, y = Amount,
             group = SC_Commodity_Desc,
             )) +
  geom_line()+
  labs(title = "Change in Amount Exported for Oats From 1989 to 2022 ",
       x = "Year(1989 -2022)",
       y = "Amount in 1,000s of Metric Tons") +
  scale_x_continuous(breaks = seq(1989, 2022, by = 3), labels = seq(1989, 2022, by = 3)) +
    scale_color_discrete(name = "Grain Type")
```




```
# Making the graph for Sorghum exports
Full_feed_grains %>%
  filter(SC_Attribute_Desc == "Exports, from U.S. to specified destination") %>%
  filter(Year_ID <= 2022 & SC_Commodity_Desc == "Sorghum")%>%
  ggplot(aes(x = Year_ID, y = Amount,
             group = SC_Commodity_Desc,
             )) +
  geom_line()+
  labs(title = "Change in Amount Exported for Sorghum From 1989 to 2022 ",
       x = "Year(1989 - 2022)",
       y = "Amount in 1,000s of Metric Tons") +
  scale_x_continuous(breaks = seq(1989, 2022, by = 3), labels = seq(1989, 2022, by = 3)) +
    scale_color_discrete(name = "Grain Type")
```


Change in Amount Exported for Sorghum From 1989 to 2022
Amount in 1,000s of Metric Tons
7500
5000
2500
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
2022
Year(1989 − 2022)