Loading packages

```
library(tidyverse) ## Data manipulation
library(here)      ## Easy filepaths
library(janitor)   ## Clean column names
library(flextable) ## Output findings in nice table
library(ggthemr)   ## Creating cool themes
library(patchwork) ## Combining graphs side-by-side
```

Read in Data

```
clim_df <- read_table(here("clim.txt")) %>%
  clean_names()
```

Source Function

```
source(here('almond_profit_function.R'))
```

Application of Function to clim.txt

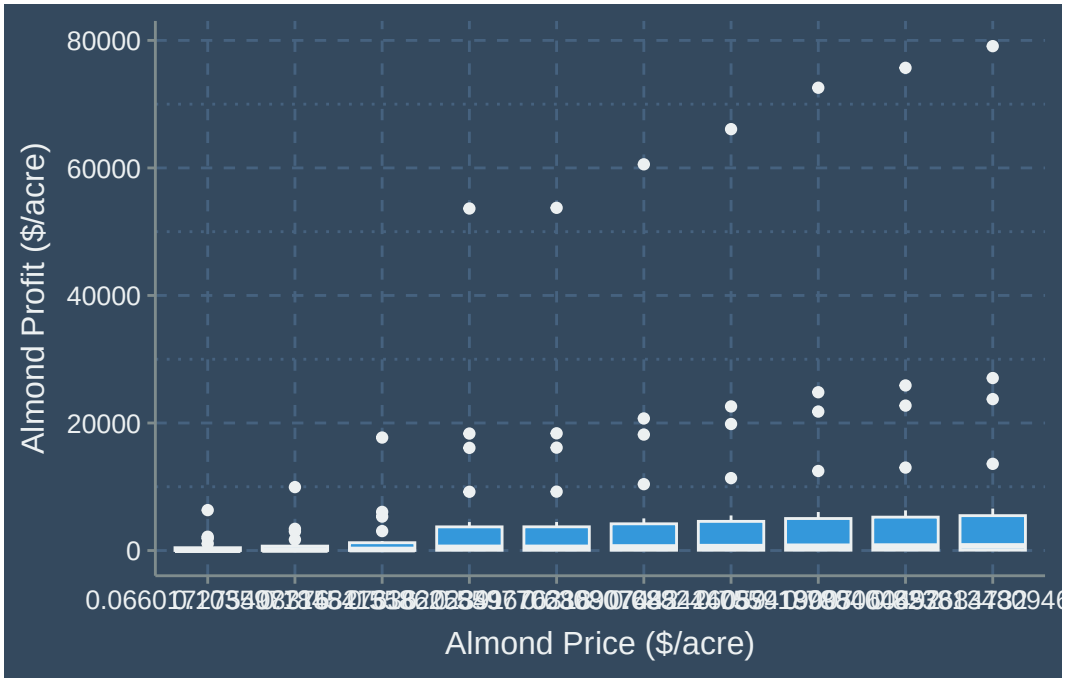
```
profits_per_year <- almond_profit(clim_df, almond_price = 4036, average_yield = 50)

profit_model <- tibble(
  year = unique(clim_df$wy),
  profits = profits_per_year
)
profit_model
```

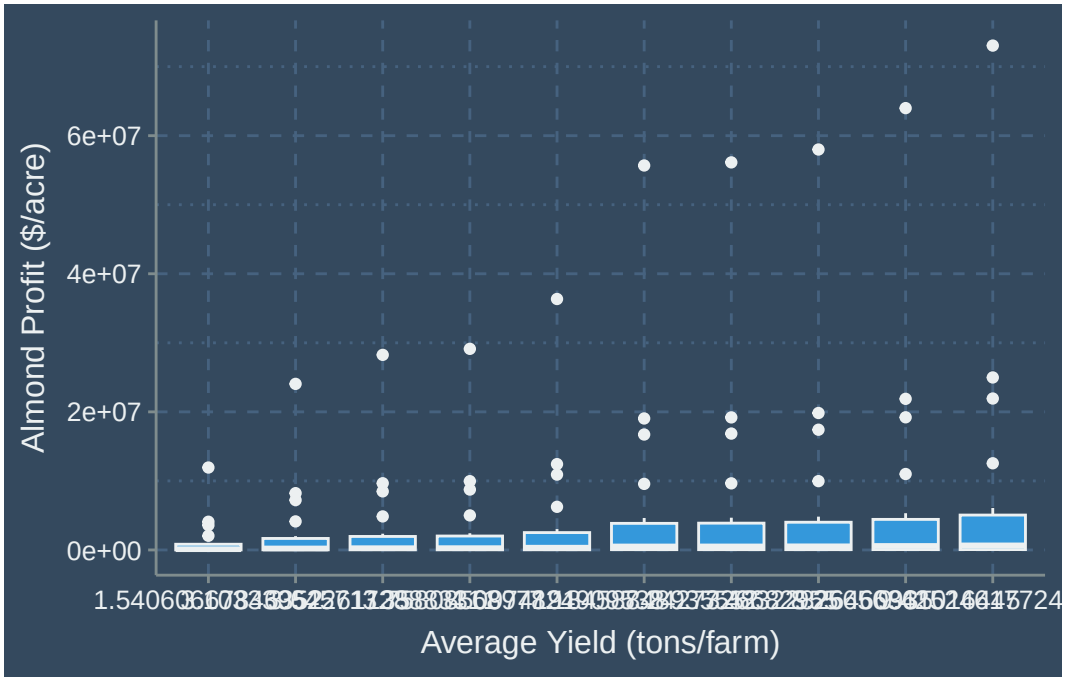
```
# A tibble: 22 x 2
    year    profits
   <dbl>      <dbl>
 1  1989      8721.
 2  1990   1952370.
 3  1991  13988052.
 4  1992   3193175.
 5  1993   4135794.
 6  1994    577122.
 7  1995 387518236.
 8  1996    844638.
 9  1997  66590073.
10  1998   5690745.
# i 12 more rows
```

Informal Sensitivity Analysis

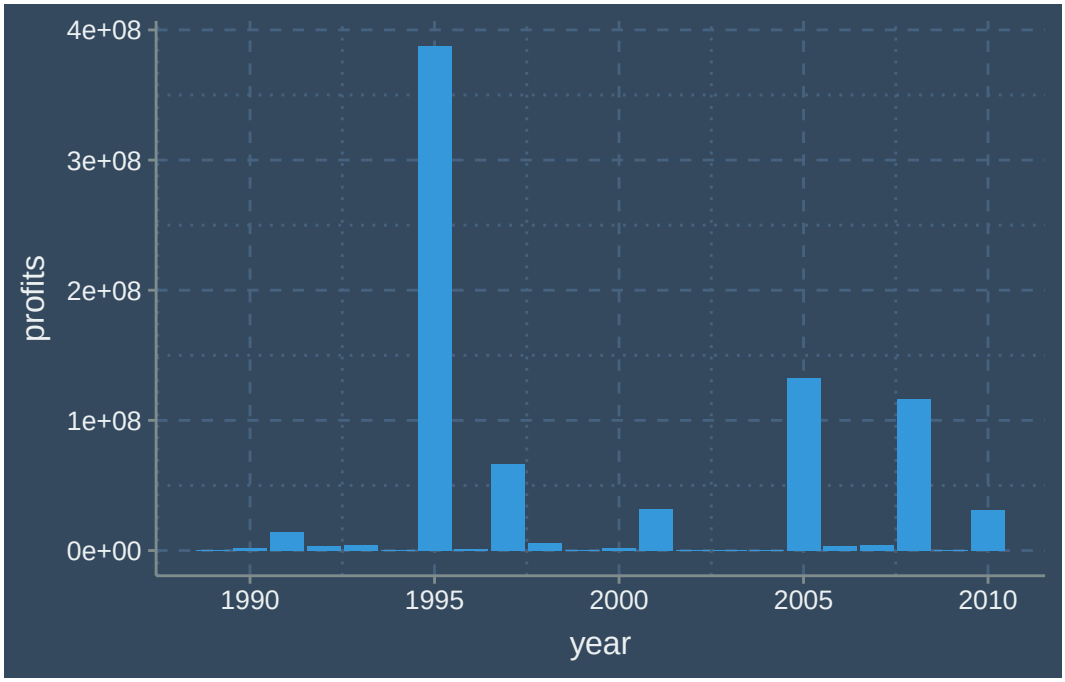
```
ggthemr('flat dark', type ='outer', layout= 'scientific')
# Run the almond_profit function with different parameter values and collect the results

# Holding average yield to 50 Tons
parameter_values <- runif(n = 10 , min =.01, max = 0.9)
profit_results <- data.frame()

for (param in parameter_values) {
  profit <- almond_profit(clim_df, almond_price = param)
  temp_df <- data.frame(parameter = param, profit = profit)
  profit_results <- rbind(profit_results, temp_df)
}

# Use ggplot to create a boxplot of profits against the input parameters
price_diff_plot <- ggplot(profit_results, aes(x = factor(parameter), y = profit)) +
  geom_boxplot() +
  labs(x = "Almond Price ($/acre)", y = "Almond Profit ($/acre)")
```

```
# Run the almond_profit function with different parameter values and collect the results
average_yield_values <- runif(n = 10 , min = 1, max = 10)
profit_results <- data.frame()

for (avg_yield in average_yield_values) {
  profit <- almond_profit(clim_df, average_yield = avg_yield)
  temp_df <- data.frame(average_yield = avg_yield, profit = profit)
  profit_results <- rbind(profit_results, temp_df)
}

# Use ggplot to create a boxplot of profit against the input average yield values
yield_diff_plot <-ggplot(profit_results, aes(x = factor(average_yield), y = profit)) +
  geom_boxplot() +
  labs(x = "Average Yield (tons/farm)", y = "Almond Profit ($/acre)")
```






```
ggplot(profit_model, aes(x = year, y = profits)) +
  geom_col()
```


4e+08
3e+08
2e+08
1e+08
0e+00
profits
1990
1995
2000
2005
2010
year