American Community Survey

Introduction

The objective of this project was analyzing the data of the 2013 American Community Survey (ACS) to figure out whether an employed PhD makes more money compared to a working bachelor or master degree holder. To do this, I concentrated on B.Sc, MSc, and PhD holders data in ACS.

Total Number of BSc , MSc, and PhD holders

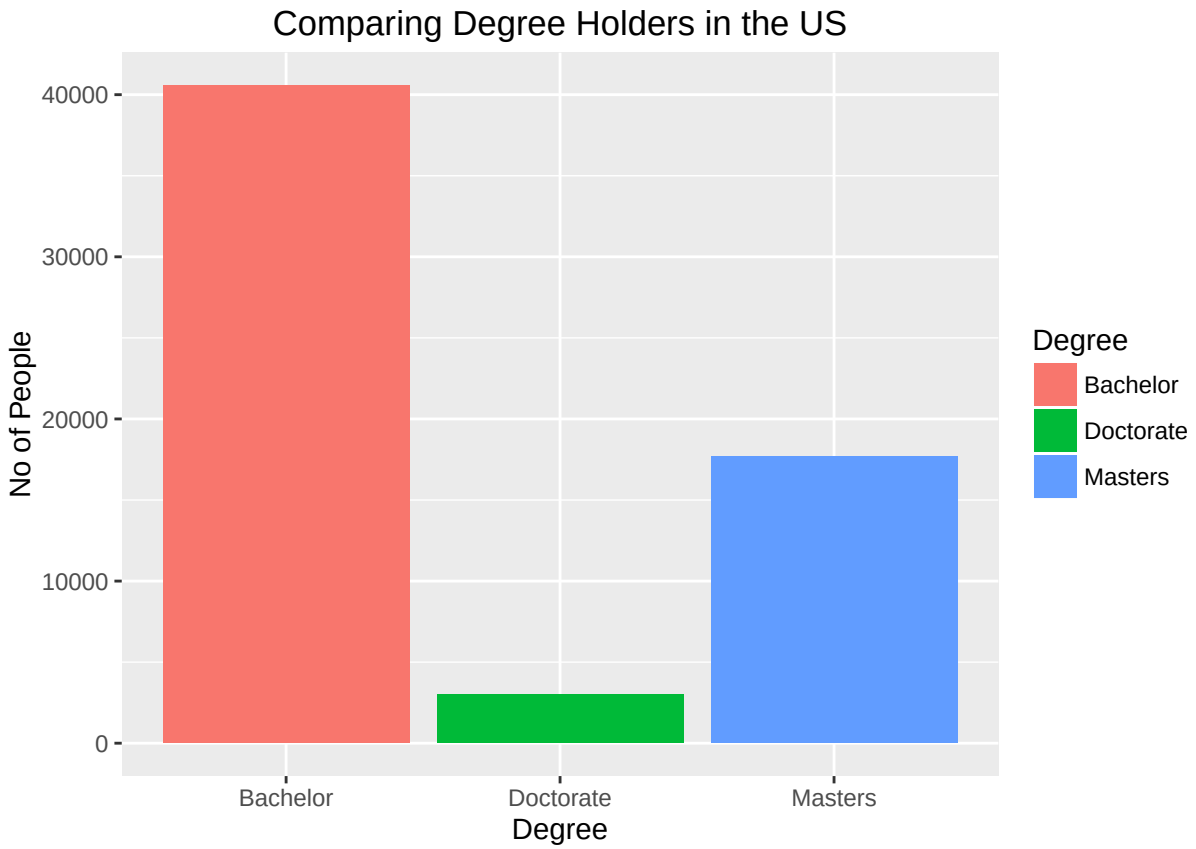
My first analysis was comparing the total number of BSc, MSc, and PhD holders in the US. I first created a clean data set `AC_Survey_Subset_Cleaned` (I got this cleaned data by removing NA values, and by extracting only the bachelors, masters & PhD's), and next I made use of the [dplyr package] to calculate each number:

```
# Prepare degree codes
degree_codes <- data.frame(SCHL = c(21, 22, 24),
                           Degree = c("Bachelor", "Masters", "Doctorate"))

# Use the pipe operator and chaining
ac_survey_clean <- ac_survey %>%
  tbl_df() %>%
  na.omit() %>%
  filter(SCHL %in% c(21,22,24)) %>%
  inner_join(degree_codes)

# Group by SCHL and count each group
degree_holders <- ac_survey_clean %>%
  group_by(Degree) %>%
  summarize(count = n())

# Print out degree_holders
degree_holders
```

```
## Source: local data frame [3 x 2]
##
##      Degree count
##      <fctr> <int>
## 1  Bachelor 40561
## 2 Doctorate  3000
## 3   Masters 17680
```

We learnt that there are `bachelors` (individuals with a bachelor degree), `masters` (individuals with a masters degree), and `PhDs` (individuals with a PhD). Visually this gives:

```
# Visualize the number of Bachelor, Master and PhD holders
ggplot(degree_holders, aes(x = Degree, y = count, fill = Degree)) +
  geom_bar(stat = "identity") +
  xlab("Degree") +
  ylab("No of People") +
  ggtitle("Comparing Degree Holders in the US")
```



The visualization of the data was done using the ggplot2 package.

Do PhD's Earn more?

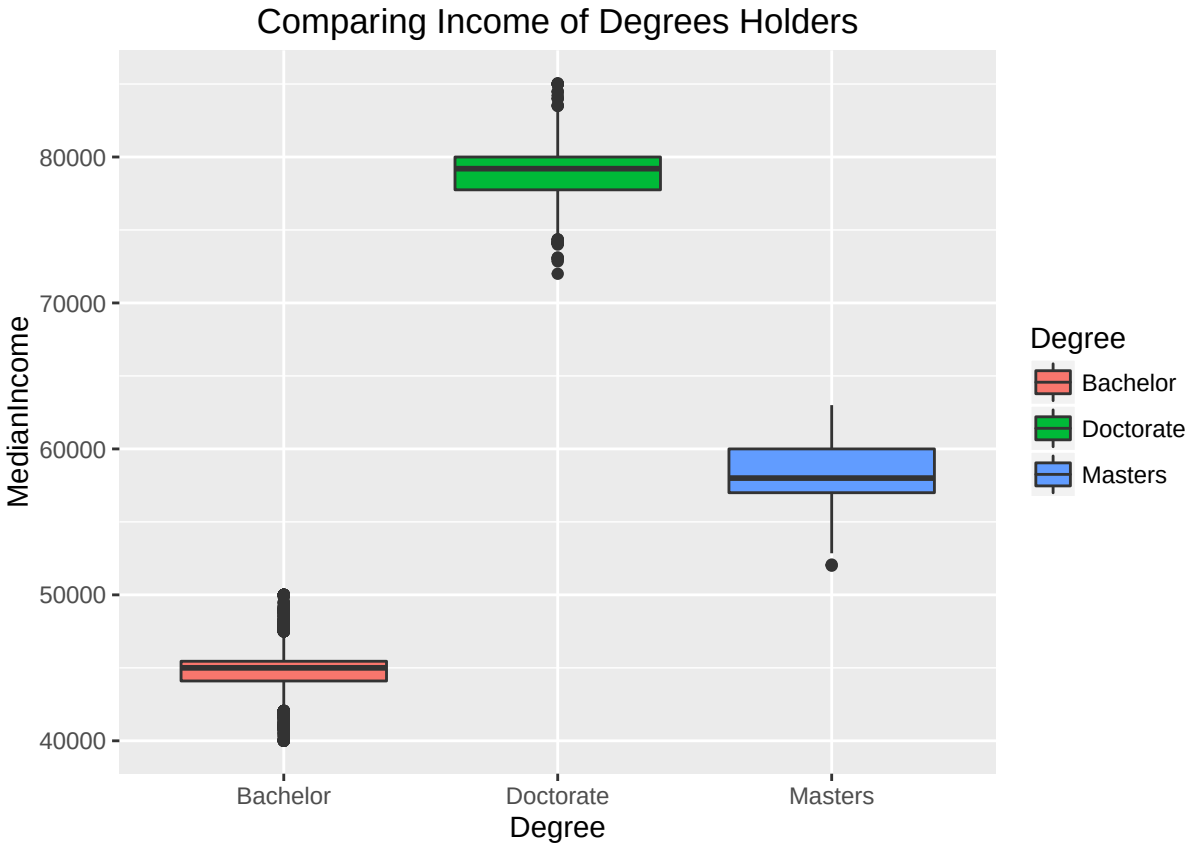
Next, I needed to figure out whether it's a smart career choice moneywise to pursue a PhD.I created a new data set (named `income`). Income is created by taking 5000 times a random sample of 1000 observations from The American Community Survey. For each sample `min()`, `max()`, `median()`, and `IQR()` is calculated.

```
# Take 5000 random samples of 1000 observations & calculate median income
over_thousand <- ac_survey_clean %>%
  filter(PINCP > 1000) %>% # exclude obserations with income under 1000
  group_by(Degree)

freq <- 5000 # 5000 samples
income <- NULL
for (i in 1:freq) {
  # Select 1000 observations
  sample <-  sample_n(over_thousand, 1000)

  # Calculate stats by degree
  sample_stats <- summarise(sample,
                            MinIncome = min(PINCP),
                            MaxIncome = max(PINCP),
                            MedianIncome = median(PINCP),
                            IncomeRange = IQR(PINCP))
```

```
  income <- rbind(income, sample_stats)
}
```

`income` can now be used to create three boxplots of Median income for each degree level:

```
# Create the boxplots
ggplot(income, aes(x = Degree, y = MedianIncome, fill = Degree)) +
  geom_boxplot() +
  ggtitle("Comparing Income of Degrees Holders")
```



The graph clearly shows it is a smart career move to pursue a PhD.