STAT 478 Project

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Mar 19, 2023

```r
# check if `tidyr` package is installed; otherwise, install
# and load if 'tidyr' is absent
if (!require("tidyr")) install.packages("tidyr", repos = "https://cloud.r-project.org")

# load libraries

# rename
library(dplyr)
```

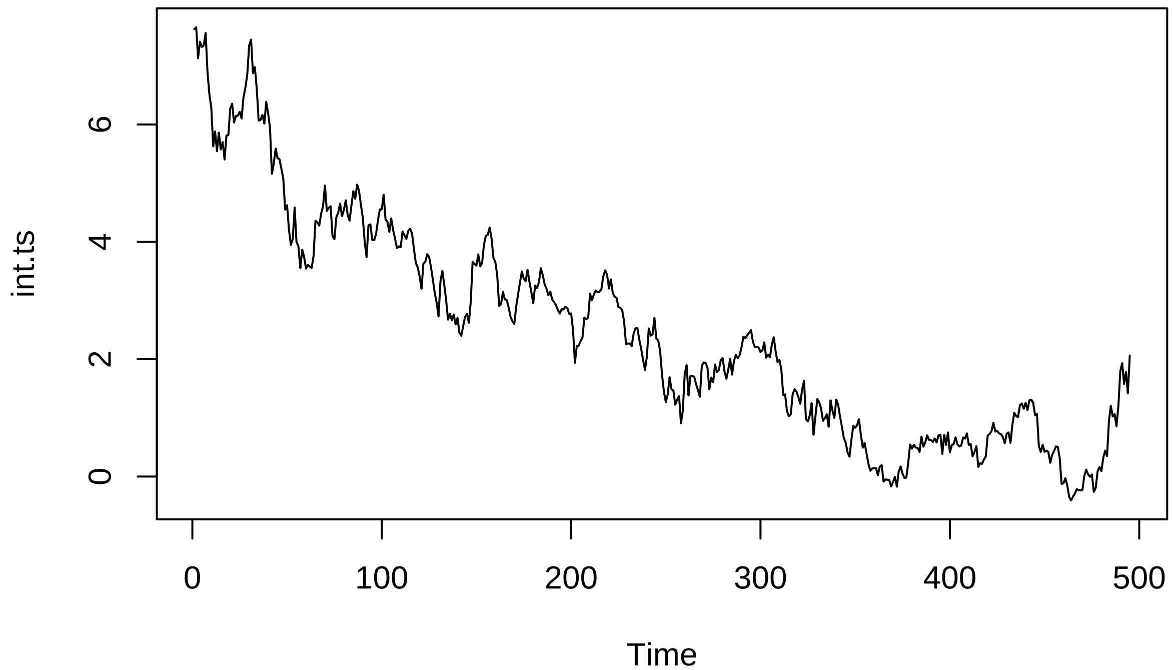
Introduction

The Fred STL dataset tracks the 10-Year Real Interest Rate in the United States. The 10-Year Real Interest Rate provides valuable insights into the state of the economy and the financial market, as it provides a measure of the real cost of borrowing and the expected return on investment. When the 10-Year Real Interest Rate is low, it can stimulate economic growth by making borrowing cheaper and encouraging investment. When the 10-Year Real Interest Rate is high, it can restrict economic growth by increasing the cost of borrowing and reducing investment.

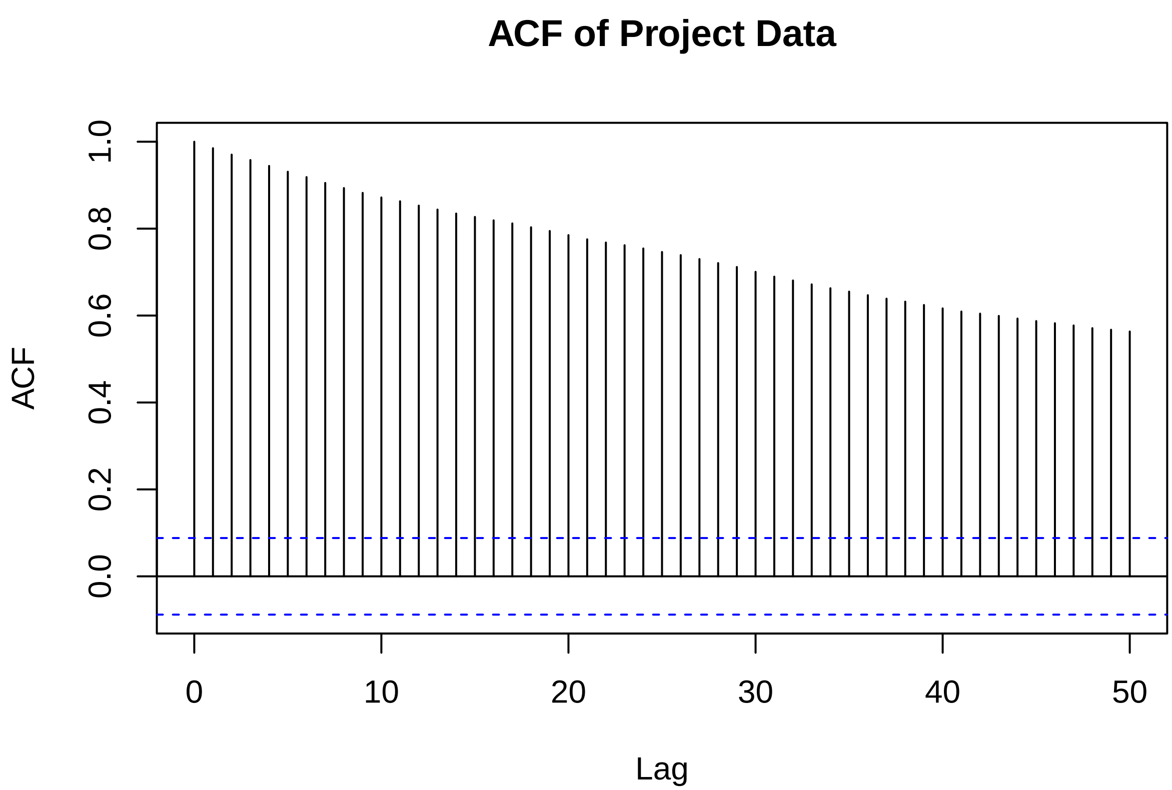
```r
# read in data set
int.rate <- read.csv("RIRA10Y.csv")

# rename columns for easier data manipulation
int.rate <- int.rate %>%
    rename(INT_RATE_10Y = REAINTRATREARAT10Y)

# convert date to type(date)
int.rate <- int.rate %>%
    mutate(DATE = as.Date(DATE, sep = "-", "%Y-%m-%d"))
str(int.rate)
```

```
## 'data.frame':    495 obs. of  2 variables:
##  $ DATE        : Date, format: "1982-01-01" "1982-02-01" "1982-03-01" ...
##  $ INT_RATE_10Y: num  7.62 7.66 7.13 7.41 7.32 ...
```

```r
int.ts <- ts(int.rate$INT_RATE_10Y)
plot(int.ts)
```




```
int_acf = acf(int.rate$INT_RATE_10Y, lag.max = 50, type = "correlation",
    main = "ACF of Project Data")
```



1. Problem definition

2. Data description

3. Data Analysis

4. Model specification and fitting

5. Model validation and diagnostics

6. Forecasting

Conclusion