Visualization of the Freeny Dataset

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```
data("freeny")


str(freeny)
```

```
'data.frame':   39 obs. of  5 variables:
 $ y                   : Time-Series  from 1962 to 1972: 8.79 8.79 8.81 8.81 8.91 ...
 $ lag.quarterly.revenue: num  8.8 8.79 8.79 8.81 8.81 ...
 $ price.index          : num  4.71 4.7 4.69 4.69 4.64 ...
 $ income.level         : num  5.82 5.83 5.83 5.84 5.85 ...
 $ market.potential     : num  13 13 13 13 13 ...
```

```
head(freeny)
```

```
             y lag.quarterly.revenue price.index income.level market.potential
1962.25 8.79236               8.79636     4.70997      5.82110          12.9699
1962.5  8.79137               8.79236     4.70217      5.82558          12.9733
1962.75 8.81486               8.79137     4.68944      5.83112          12.9774
1963    8.81301               8.81486     4.68558      5.84046          12.9806
1963.25 8.90751               8.81301     4.64019      5.85036          12.9831
1963.5  8.93673               8.90751     4.62553      5.86464          12.9854
```

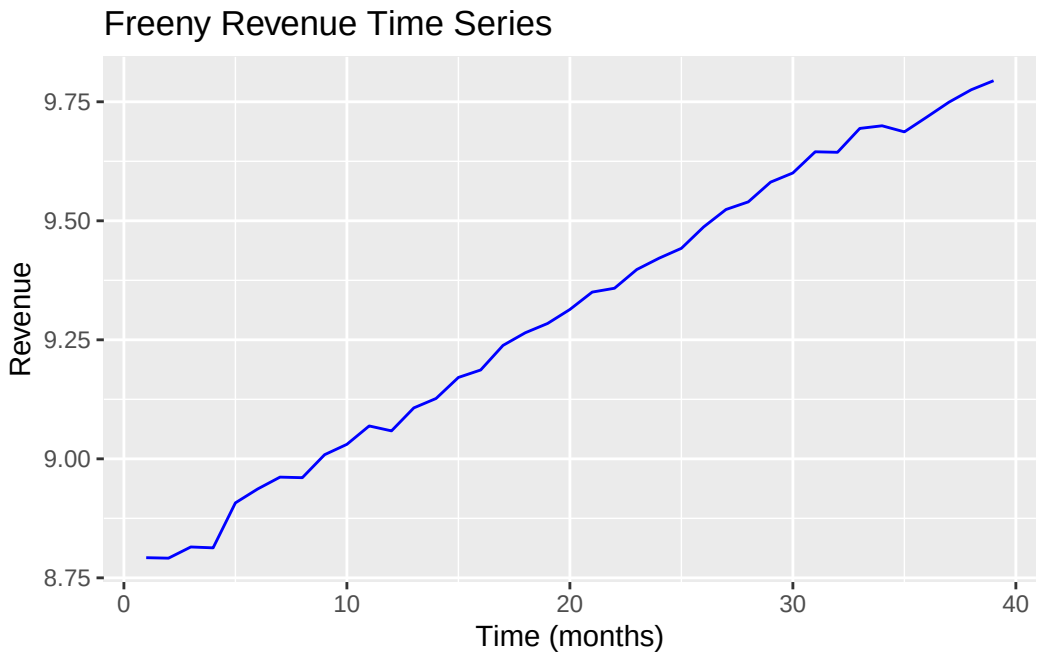
Introduction

The Freeny dataset is a built-in dataset in R that contains 39 monthly observations of economic variables related to revenue. The main variable of interest is revenue (y), and it is accompanied by three predictors: price index, income level, and market potential.Revenue, representing the company's monthly income, is our dependent variable. It shows an overall increasing trend over time. Price Index is an indicator of the general level of goods or service prices, which can be used to assess how price changes affect revenue. Income Level reflects the average

income of consumers in the target market, and purchasing power is strongly associated with income. Market Potential measures the size or potential demand of the market, representing the overall capacity of the industry; a larger market potential implies the possibility of higher future revenue. These three variables can be used to predict and analyze the upward or downward trends in revenue.

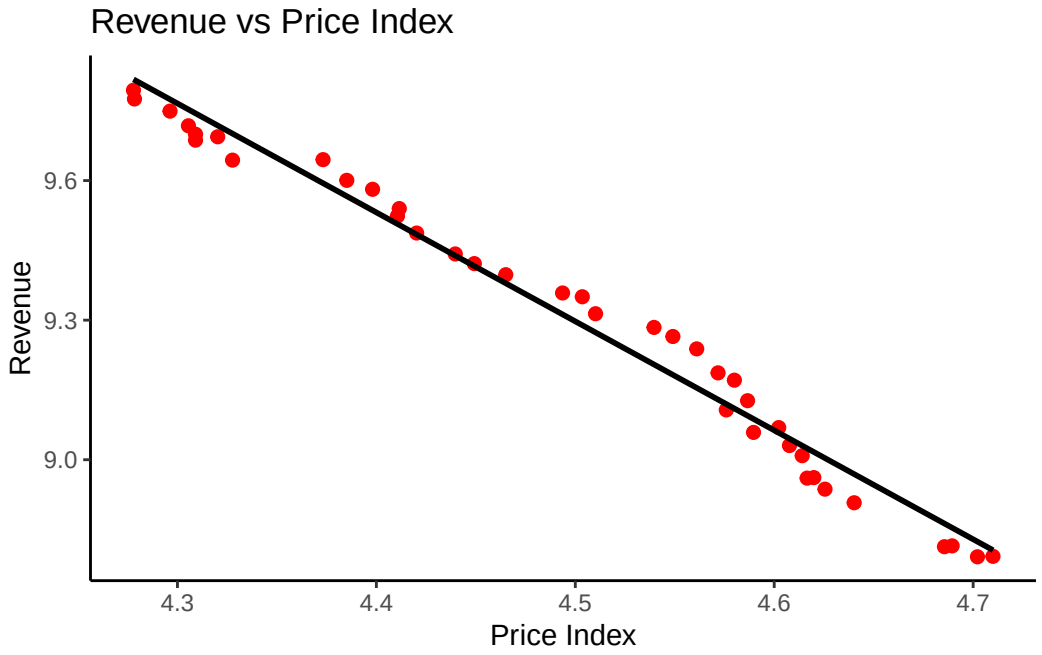
```
library(ggplot2)
ggplot(freeny, aes(x = 1:nrow(freeny), y = y)) +
  geom_line(color = "blue") +
  labs(title = "Freeny Revenue Time Series",
       x = "Time (months)", y = "Revenue")
```

```
Don't know how to automatically pick scale for object of type <ts>. Defaulting
to continuous.
```




```
ggplot(freeny, aes(x = price.index, y = y)) +
  geom_point(color = "red", size = 2) +
  geom_smooth(method = "lm", se = FALSE, color = "black") +
  labs(title = "Revenue vs Price Index",
       x = "Price Index", y = "Revenue") +
  theme_classic()
```

```
Don't know how to automatically pick scale for object of type <ts>. Defaulting
to continuous.
`geom_smooth()` using formula = 'y ~ x'
```



Conclusion

From the time series plot, we can see that revenue shows a steady upward trend over the 39 months, with only minor waves. This indicates continuous growth in the underlying economic environment. The scatter plot between revenue and price index further reveals a strong positive correlation: as the price index increases, revenue also rises. This suggests that price levels are an important explanatory factor for revenue. Overall, the Freeny dataset highlights both a clear time trend and meaningful economic relationships, making it useful for regression and time series modeling.