PHX Param_estimation

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Set working directory and read data

```
setwd("C:/Users/zl23n/OneDrive - Florida State University/Graduate-FSU/Research/2024 Airport TR-B/airpo
data <- read.csv("PHX_Annual.csv")
colnames(data) <- c("year", "passenger")
head(data)
```

```
##   year passenger
## 1 1951    240786
## 2 1952    296066
## 3 1953    325311
## 4 1954    365545
## 5 1955    442587
## 6 1956    495268
```

```
data$passenger = data$passenger / 1e7


# Create lagged column
data$passenger_next <- c(data$passenger[-1], NA)
head(data)
```

```
##   year passenger passenger_next
## 1 1951 0.0240786      0.0296066
## 2 1952 0.0296066      0.0325311
## 3 1953 0.0325311      0.0365545
## 4 1954 0.0365545      0.0442587
## 5 1955 0.0442587      0.0495268
## 6 1956 0.0495268      0.0581087
```

```
data <- data[-1, ]
head(data)
```

```
##   year passenger passenger_next
## 2 1952 0.0296066      0.0325311
## 3 1953 0.0325311      0.0365545
## 4 1954 0.0365545      0.0442587
## 5 1955 0.0442587      0.0495268
## 6 1956 0.0495268      0.0581087
## 7 1957 0.0581087      0.0658889
```

```
data <- subset(data, year < 2019)
tail(data)
```

```
##    year passenger passenger_next
```

```
## 63 2013  4.034027       4.210585
## 64 2014  4.210585       4.406750
## 65 2015  4.406750       4.341159
## 66 2016  4.341159       4.392167
## 67 2017  4.392167       4.494369
## 68 2018  4.494369       4.628834
```

```
data$y <- data$passenger_next / data$passenger
data$x <- data$passenger
```

Linear Regression

```
model <- lm(y ~ x, data = data)
summary(model)
```

```
##
## Call:
## lm(formula = y ~ x, data = data)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.175789 -0.022689  0.001058  0.028795  0.146169
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.13422    0.01013 111.997  < 2e-16 ***
## x           -0.02925    0.00412  -7.099 1.16e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.05541 on 65 degrees of freedom
## Multiple R-squared:  0.4367, Adjusted R-squared:  0.4281
## F-statistic:  50.4 on 1 and 65 DF,  p-value: 1.158e-09
```