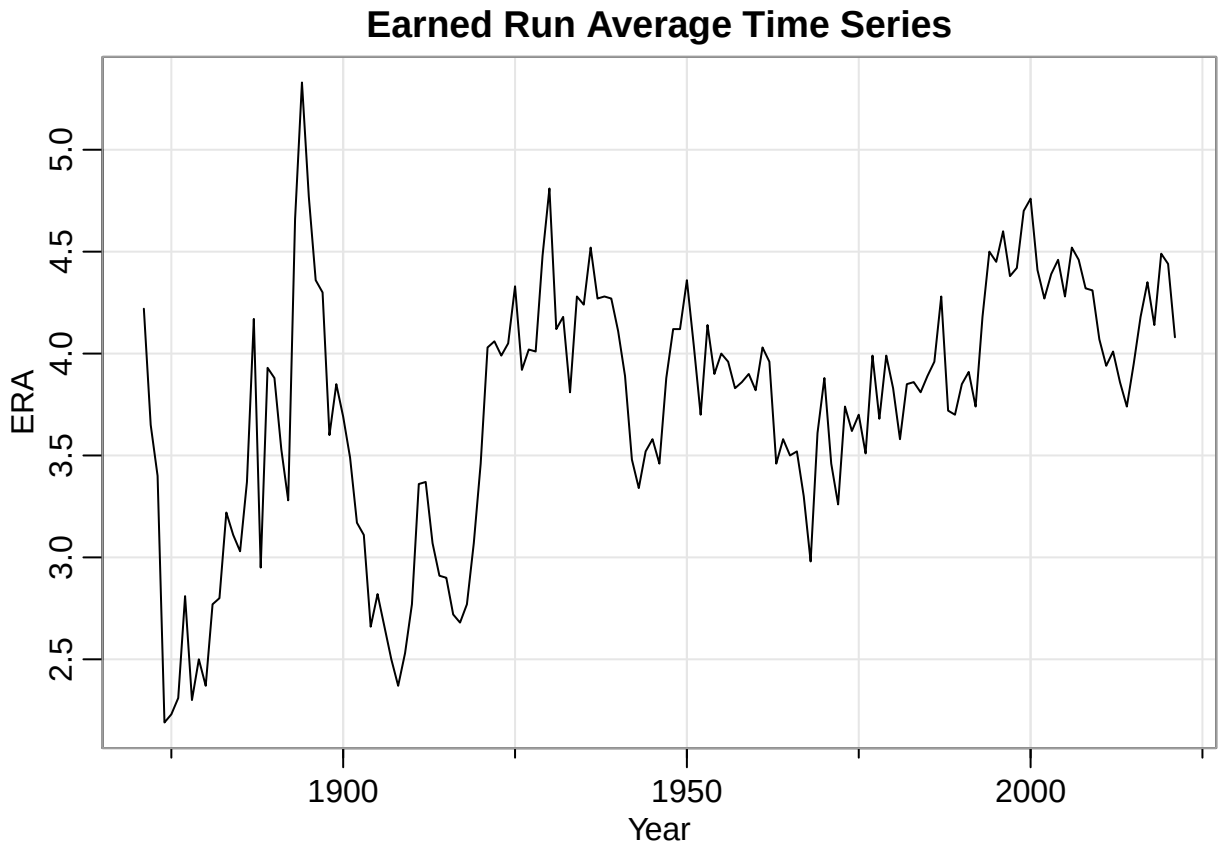
STAT 626 Project

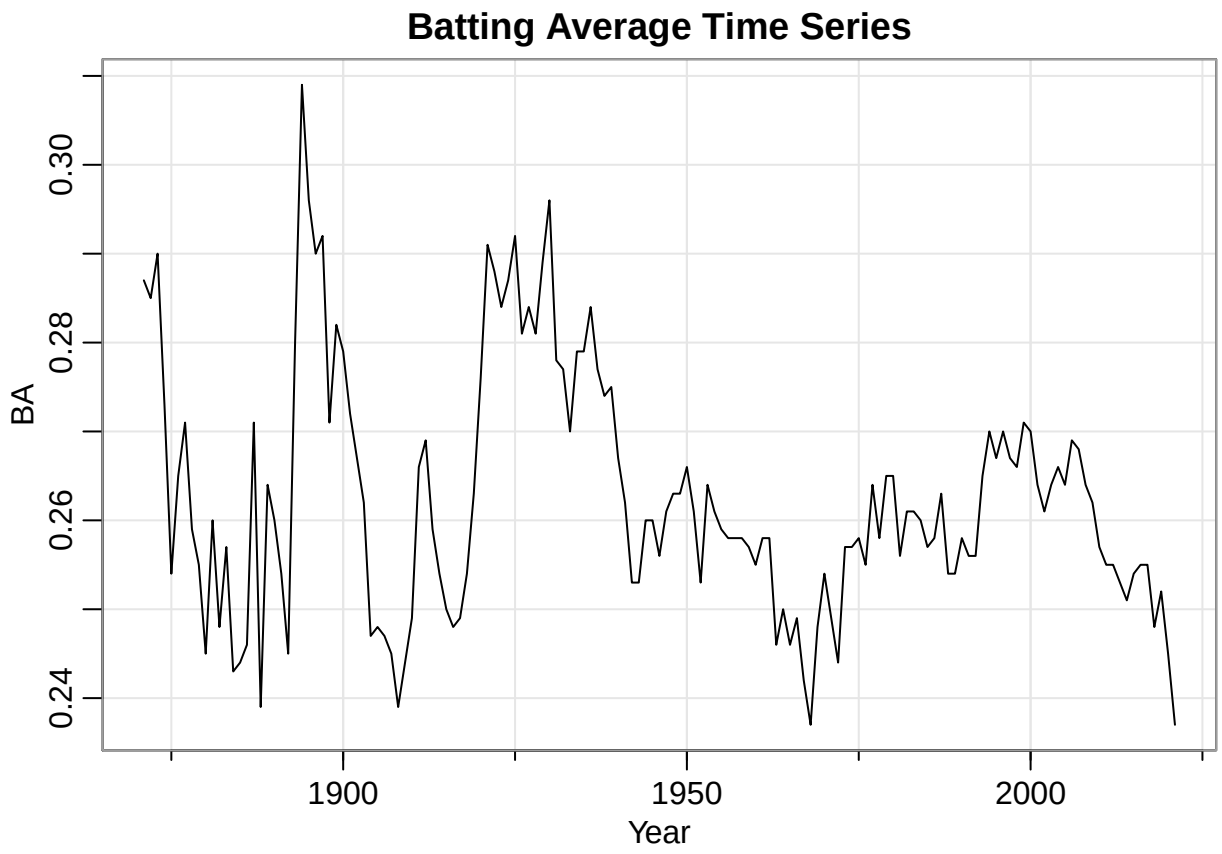
Group 9

6/2021 - 8/2021

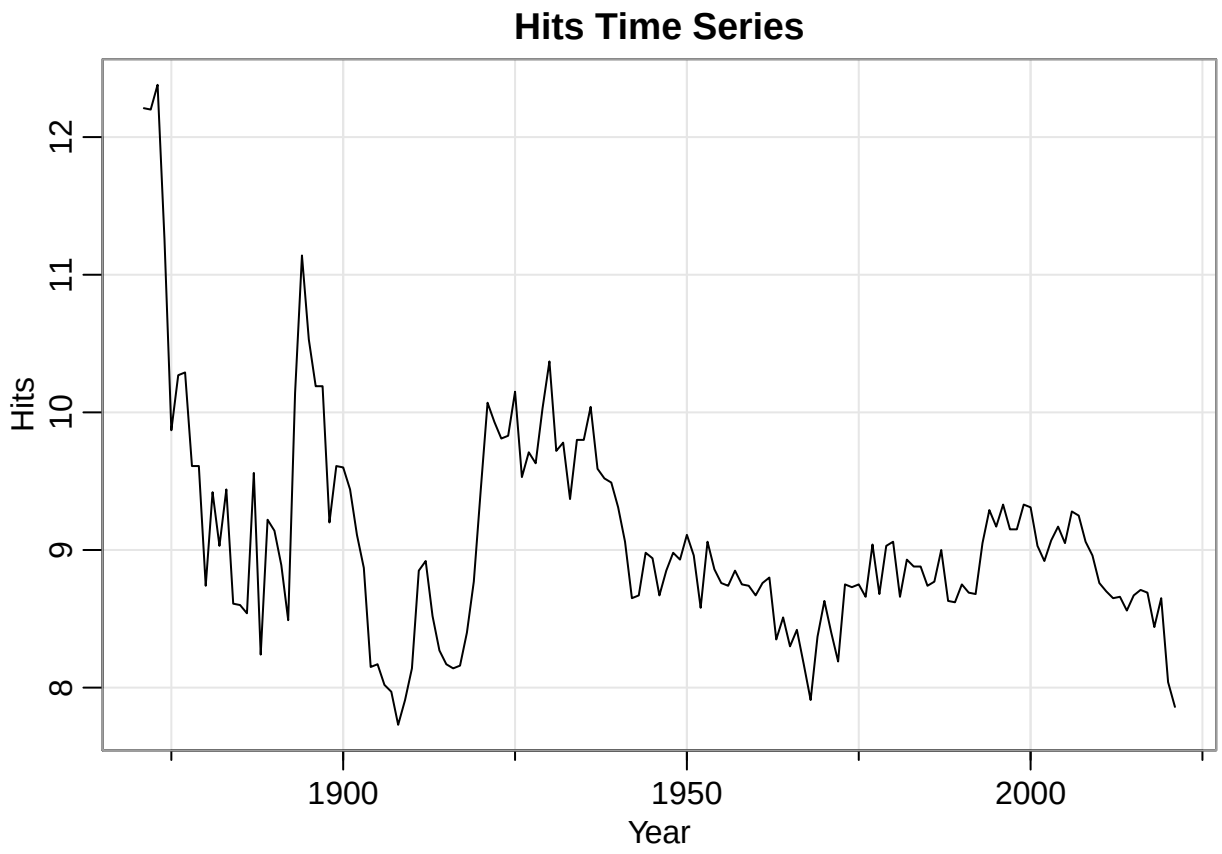
```
library(astsa)
raw <- read.csv("mlb.csv")
era <- ts(rev(raw$ERA), start = raw$Year[length(raw$Year)], end = raw$Year[1])
tsplot(era, main = 'Earned Run Average Time Series', xlab = 'Year', ylab = 'ERA')
```



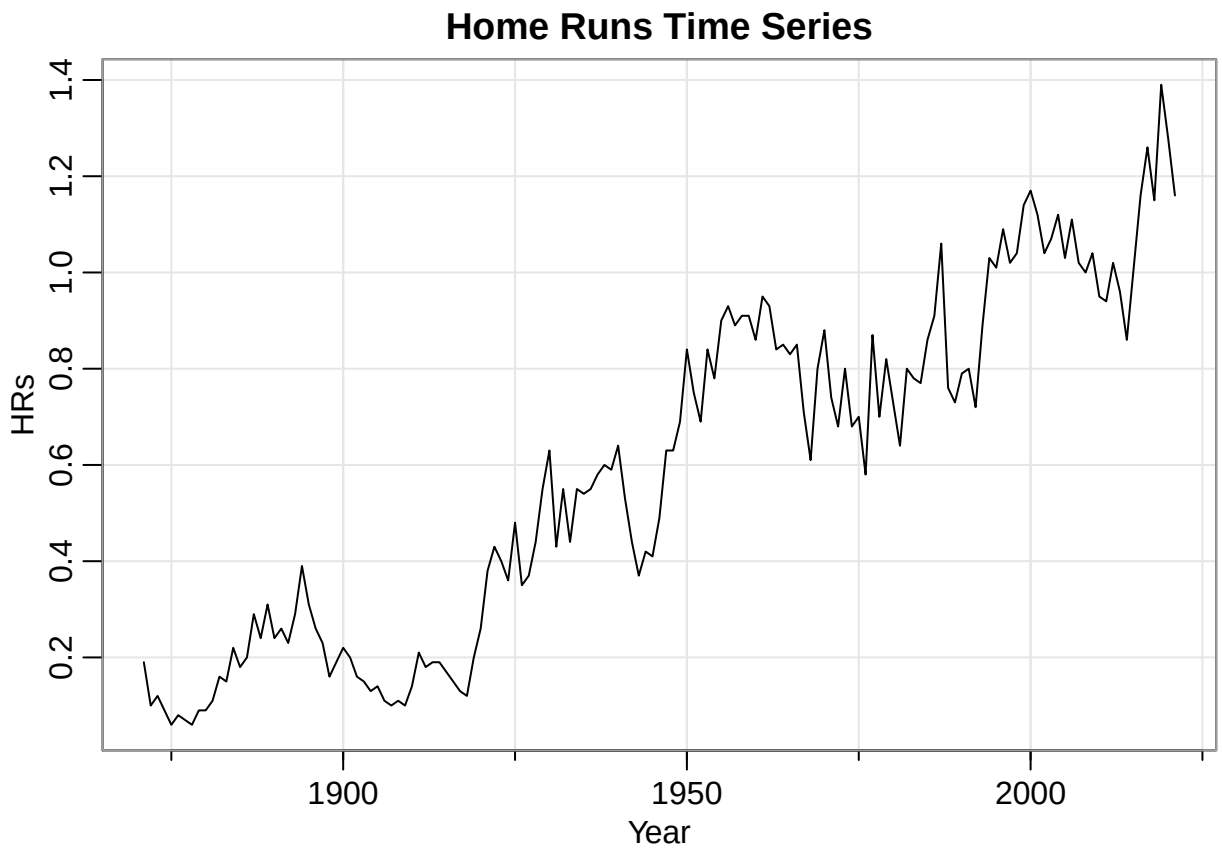

```
ba <- ts(rev(raw$BA), start = raw$Year[length(raw$Year)], end = raw$Year[1])
tsplot(ba, main = 'Batting Average Time Series', xlab = 'Year', ylab = 'BA')
```



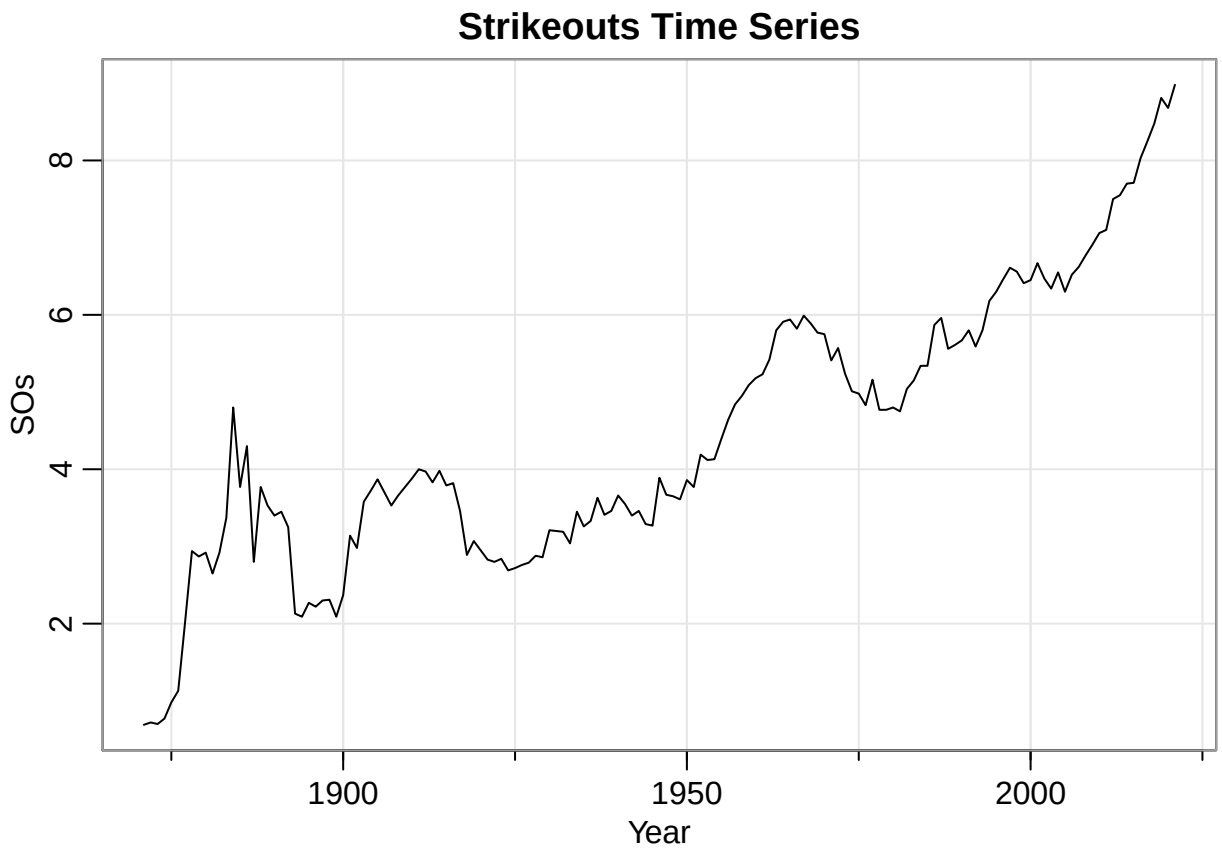

```
hits <- ts(rev(raw$H), start = raw$Year[length(raw$Year)], end = raw$Year[1])
tsplot(hits, main = 'Hits Time Series', xlab = 'Year', ylab = 'Hits')
```



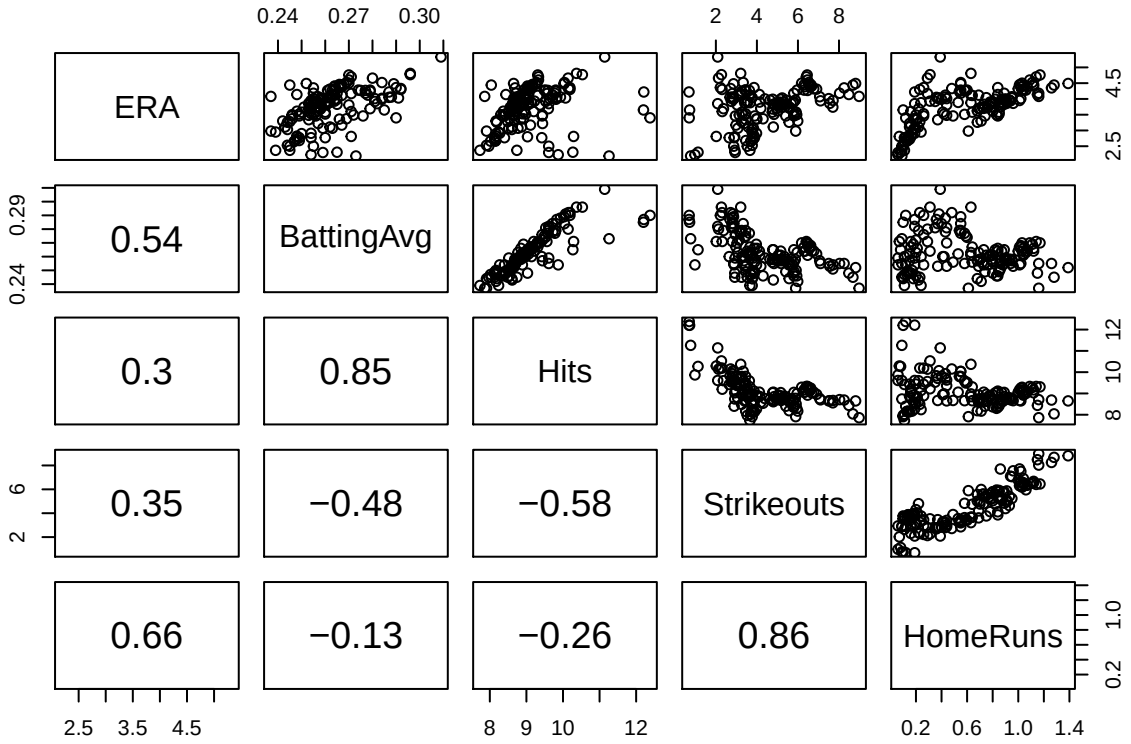

```
hrs <- ts(rev(raw$HR), start = raw$Year[length(raw$Year)], end = raw$Year[1])
tsplot(hrs, main = 'Home Runs Time Series', xlab = 'Year', ylab = 'HRs')
```



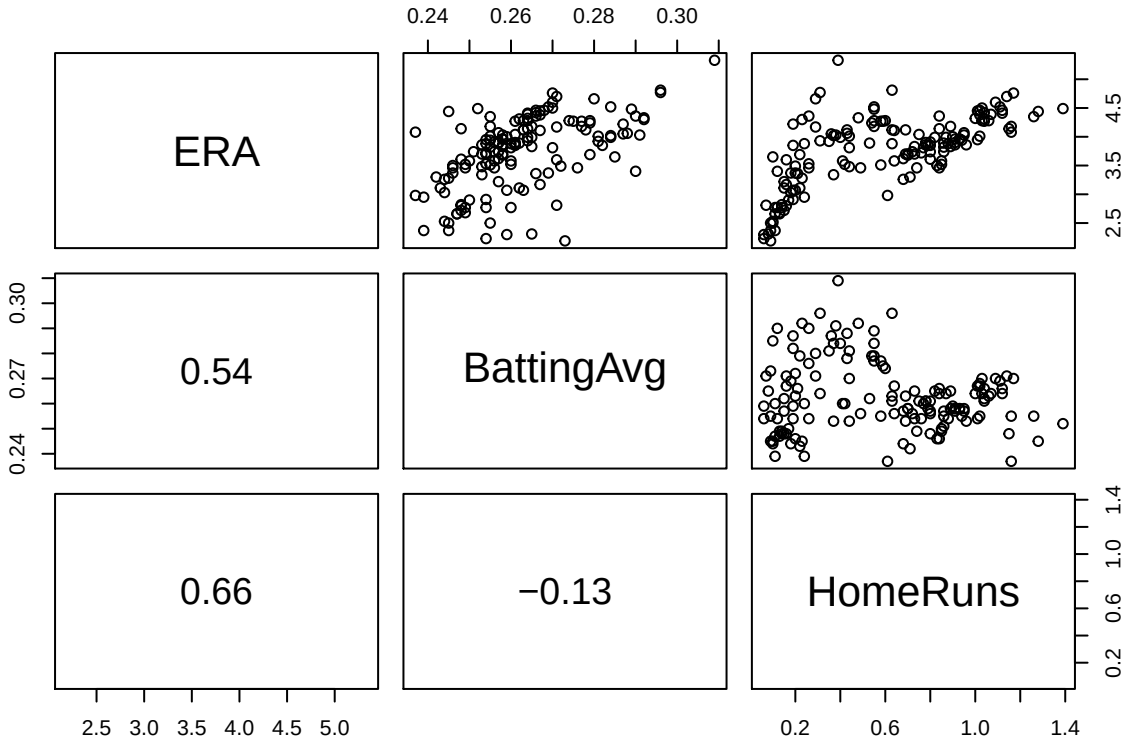

```
so <- ts(rev(raw$SO), start = raw$Year[length(raw$Year)], end = raw$Year[1])
tsplot(so, main = 'Strikeouts Time Series', xlab = 'Year', ylab = 'SOs')
```




```
panel.cor <- function(x, y, ...) {
  usr <- par("usr"); on.exit(par(usr))
  par(usr = c(0, 1, 0, 1))
  r <- round(cor(x, y), 2)
  text(0.5, 0.5, r, cex = 1.75)
}
pairs(cbind(ERA = era, BattingAvg = ba, Hits = hits, Strikeouts = so, HomeRuns = hrs), lower.panel = pa
```




```
pairs(cbind(ERA = era, BattingAvg = ba, HomeRuns = hrs), lower.panel = panel.cor)
```



a. $ERA_t = \beta_0 + \beta_1 t + w_t$
b. $ERA_t = \beta_0 + \beta_1 t + \beta_2 HR + w_t$
c. $ERA_t = \beta_0 + \beta_1 t + \beta_2 HR + \beta_3 HR^2 + w_t$
d. $ERA_t = \beta_0 + \beta_1 t + \beta_2 HR + \beta_3 HR^2 + \beta_4 BA + w_t$