Time series project

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firstly, upload the dataset, and rename the production

```
library(readr)
Milk1=read_csv("monthly-milk-production-pounds.csv")
```

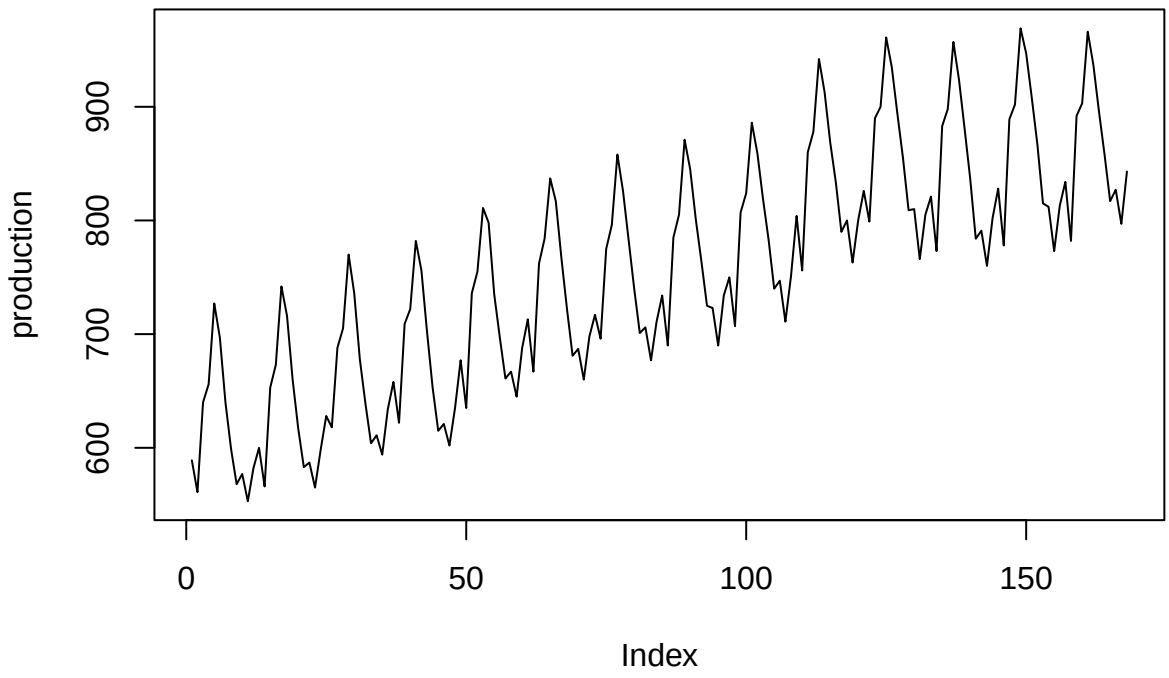
```
## Rows: 168 Columns: 2
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (1): Month
## dbl (1): Monthly milk production(pounds per cow)
```

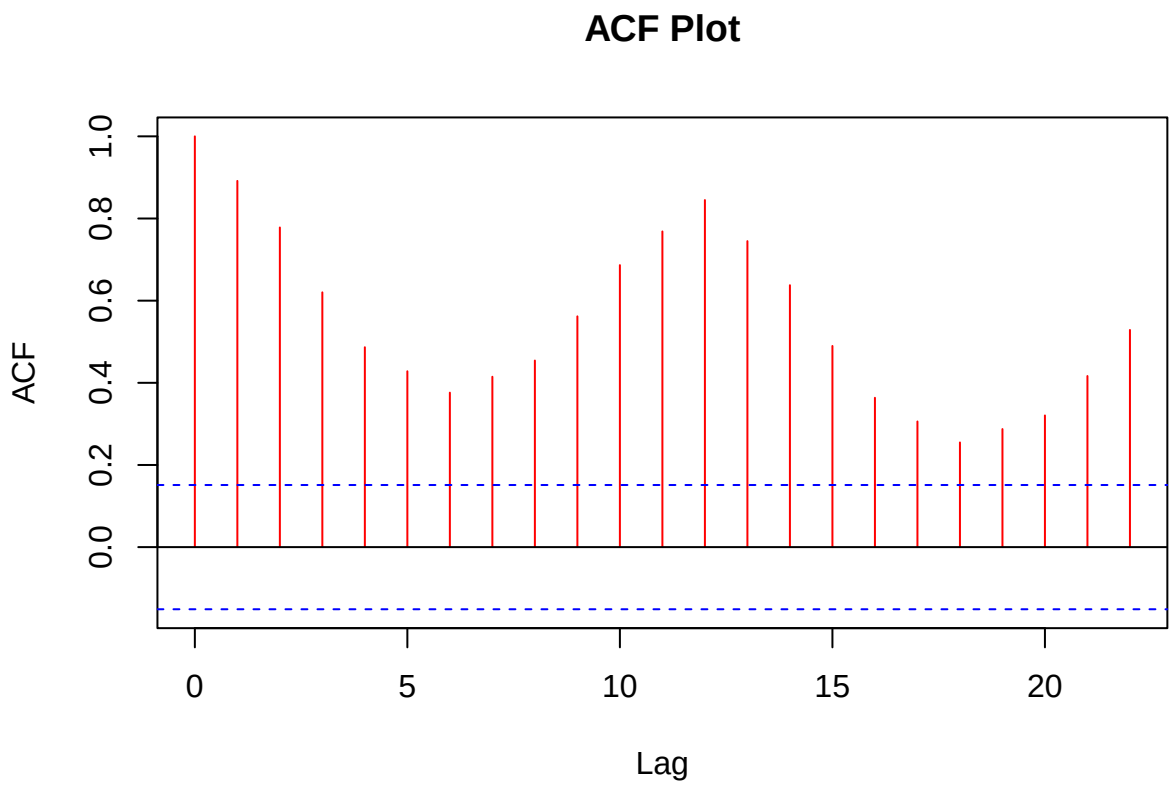
```
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
production<-Milk1$"Monthly milk production(pounds per cow)"
MP<-data.frame(Milk1$Month,production)
```

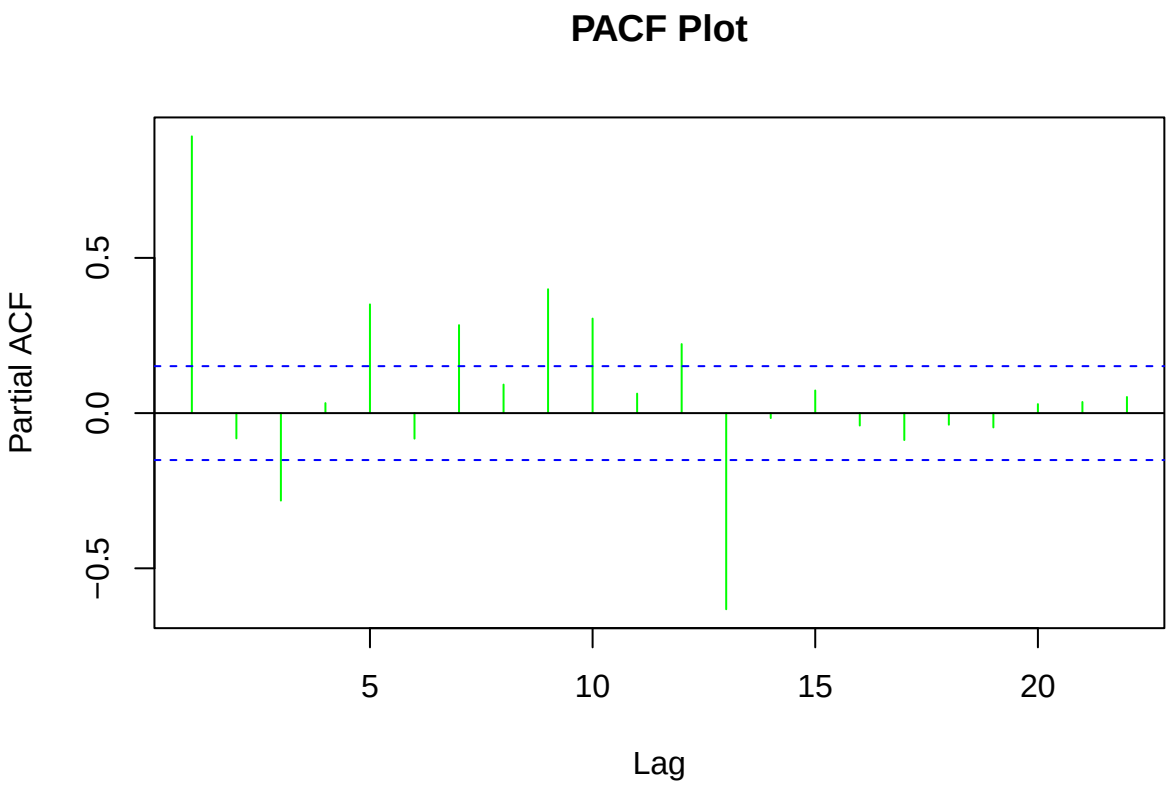
```
dates = seq(as.Date("1962-01-01"), as.Date("1975-12-01"),by = "month")
plot(production,type='l')
```




```
auto_correlation<-acf(production,plot= TRUE,type = 'correlation',main='ACF Plot',col='red')
```

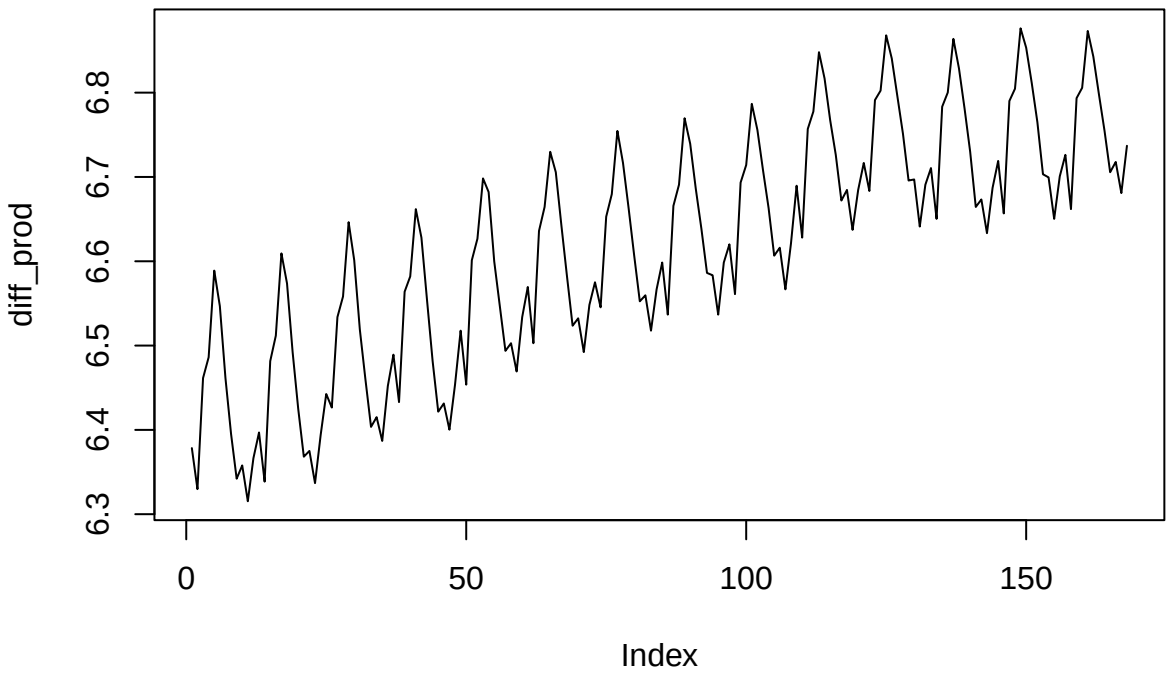



```
pacf<-pacf(production,plot=TRUE,main="PACF Plot",col='green')
```

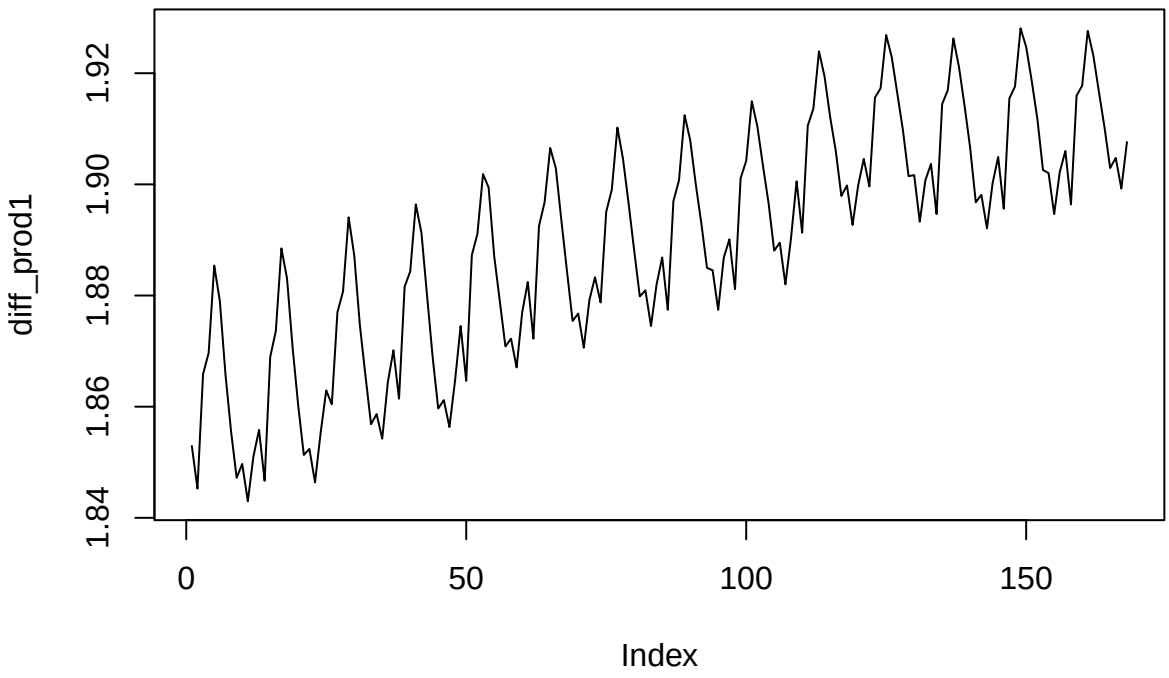


#difference of production, now the time series is stationary.

```
diff_prod<-log(production)
plot(diff_prod,type="l")
```




```
diff_prod1<-log(diff_prod)
plot(diff_prod1,type="l")
```



#calculate the mean, var, ACF, PACF for the stationary plot

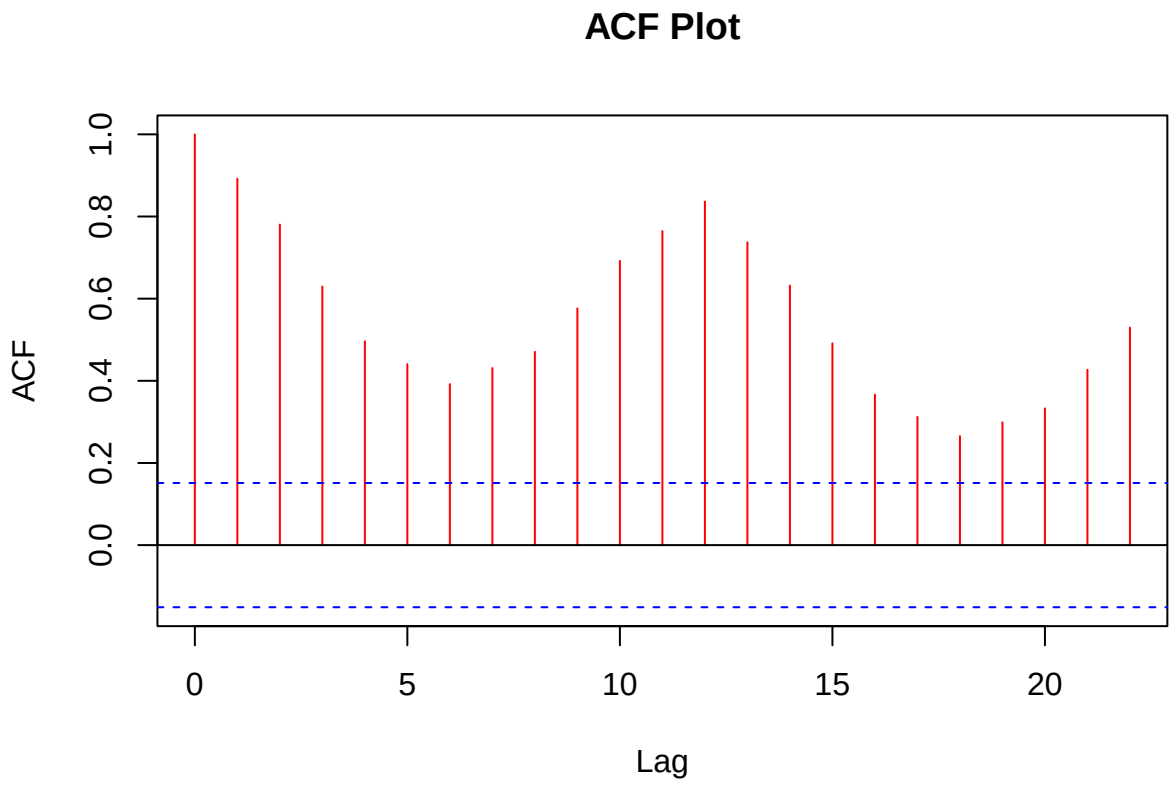
```
mean_ts<-mean(diff_prod1)
mean_ts
```

```
## [1] 1.889432
```

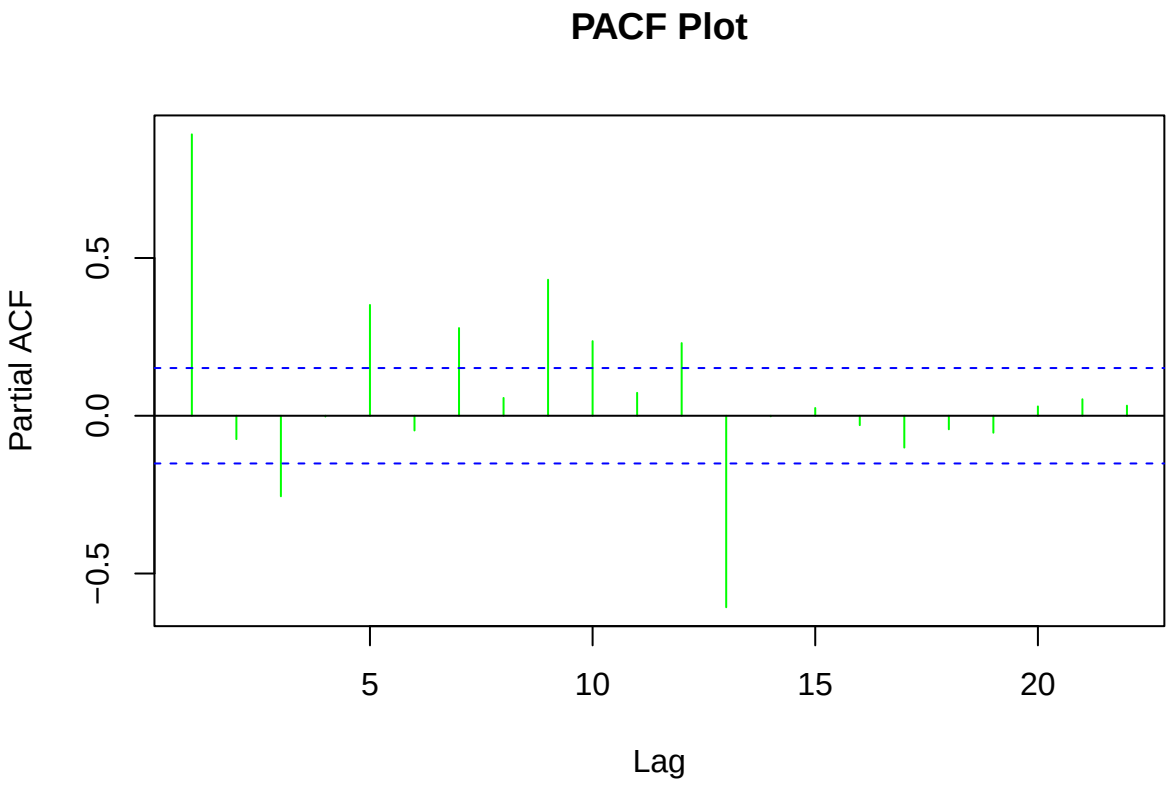
```
variance_ts<-var(diff_prod1)
variance_ts
```

```
## [1] 0.00043482
```

```
auto_correlation<-acf(diff_prod1,plot= TRUE,type = 'correlation',main='ACF Plot',col='red')
```




```
pacf<-pacf(diff_prod1,plot=TRUE,main="PACF Plot",col='green')
```


PACF Plot
Partial ACF
0.5
0.0
−0.5
5
10
15
20
Lag