AmanChauhan22BCE0476.R

Batch1

2024-09-12

```
#load the dataset of Air Passengers
data("AirPassengers")
print(AirPassengers)
```

```
##      Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
## 1949 112 118 132 129 121 135 148 148 136 119 104 118
## 1950 115 126 141 135 125 149 170 170 158 133 114 140
## 1951 145 150 178 163 172 178 199 199 184 162 146 166
## 1952 171 180 193 181 183 218 230 242 209 191 172 194
## 1953 196 196 236 235 229 243 264 272 237 211 180 201
## 1954 204 188 235 227 234 264 302 293 259 229 203 229
## 1955 242 233 267 269 270 315 364 347 312 274 237 278
## 1956 284 277 317 313 318 374 413 405 355 306 271 306
## 1957 315 301 356 348 355 422 465 467 404 347 305 336
## 1958 340 318 362 348 363 435 491 505 404 359 310 337
## 1959 360 342 406 396 420 472 548 559 463 407 362 405
## 1960 417 391 419 461 472 535 622 606 508 461 390 432
```

```
#2.check the data structure data type
str(AirPassengers)
```

```
##  Time-Series [1:144] from 1949 to 1961: 112 118 132 129 121 135 148 148 136 119 ...
```

```
class(AirPassengers)
```

```
## [1] "ts"
```

```
#3. check for missing values
any(is.na(AirPassengers))
```

```
## [1] FALSE
```

```
#4. check for the starting and the ending datatypes
start(AirPassengers)
```

```
## [1] 1949    1
```

```
end(AirPassengers)
```

```
## [1] 1960   12
```

```
#5.check for the frequency of the datatypes
frequency(AirPassengers)
```
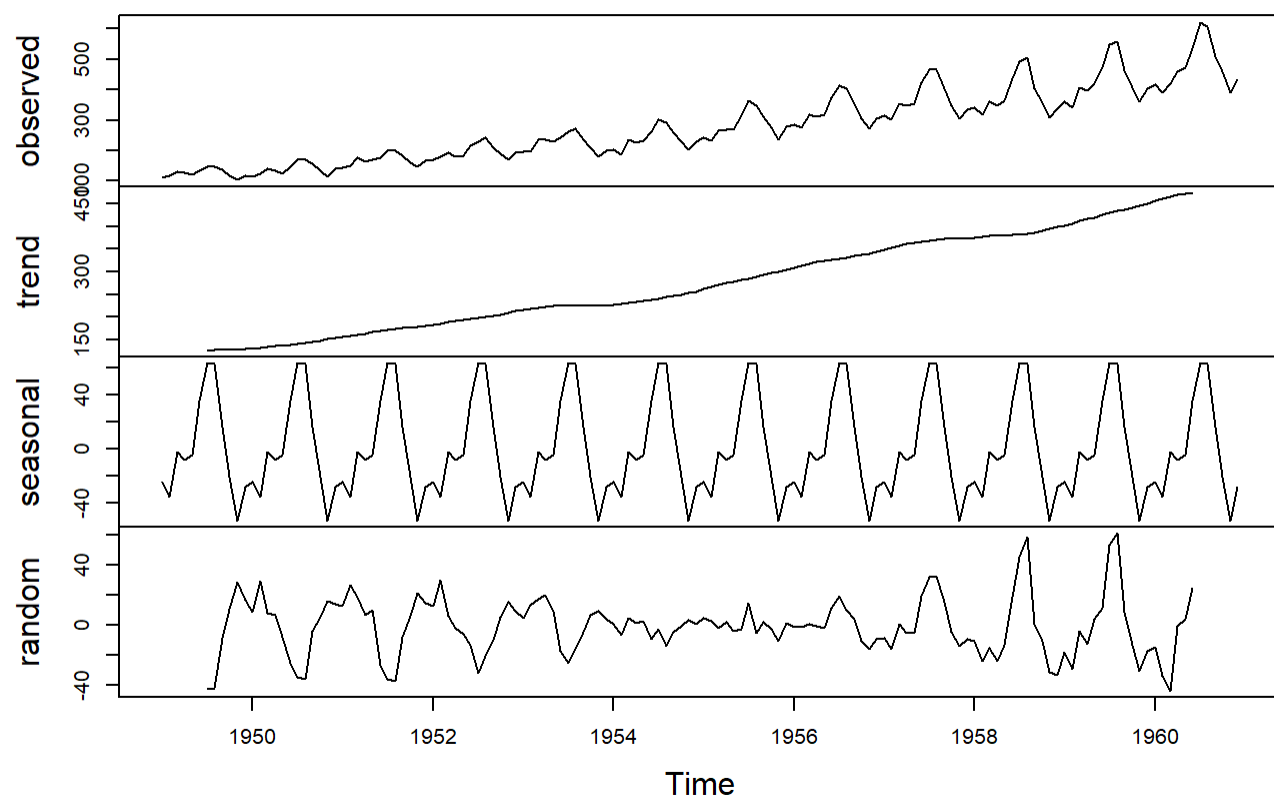
```
## [1] 12
```

```
#Get the summary of the datasets
summary(AirPassengers)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   104.0   180.0   265.5   280.3   360.5   622.0
```

```
#7.    Plot the decomposition of the dataset – Break data into trend, seasonal, and random.
(Simple plot function with decompose)
decompose_data<-decompose(AirPassengers)
plot(decompose_data)
```

Decomposition of additive time series

```
#8.Plot the dataset
plot(AirPassengers)
#9. 9.      Plot the time-series of the dataset (plot.ts())
plot.ts(AirPassengers)
#10.Draw the regressor line for the Q9. (abline(lm(AirPassengers~time))
abline(reg=lm(AirPassengers~time(AirPassengers)),col="red")
```
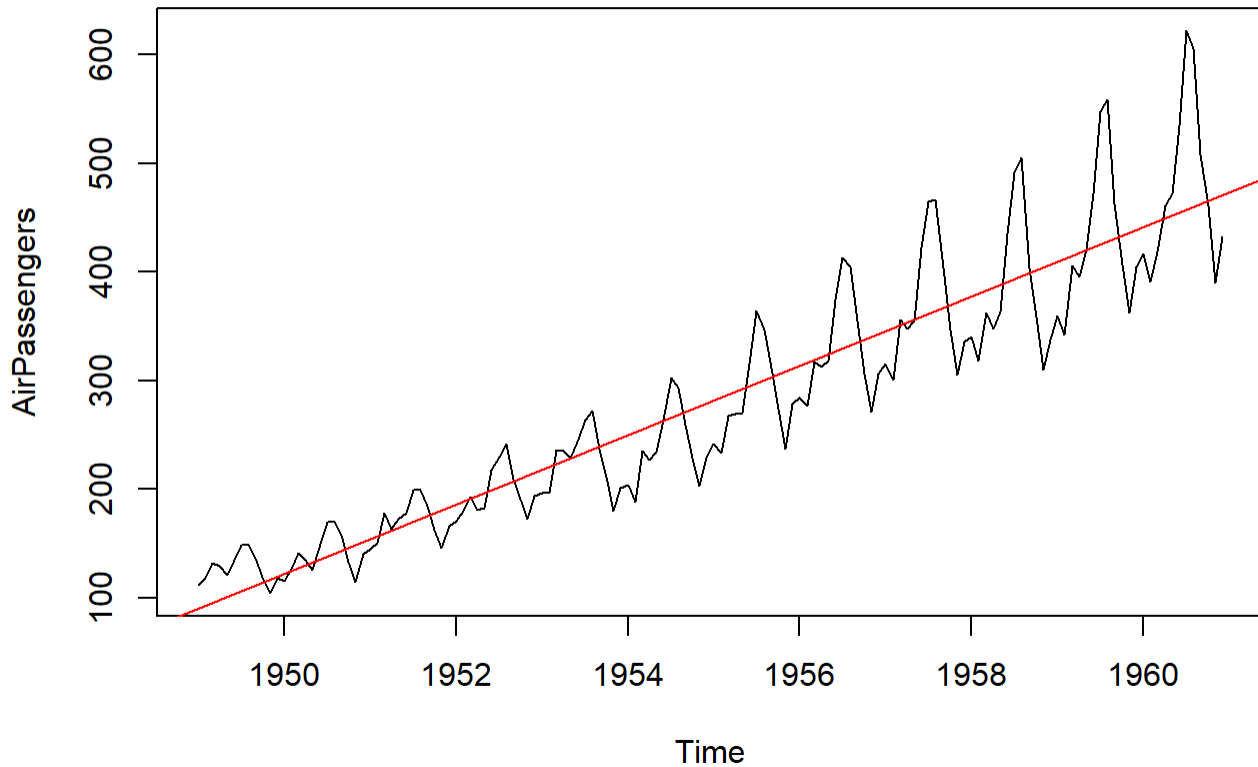


```
#11.Print the cycle across the years for the dataset. (cycle())
cycle(AirPassengers)
```

```
##         Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
## 1949    1   2   3   4   5   6   7   8   9  10  11  12
## 1950    1   2   3   4   5   6   7   8   9  10  11  12
## 1951    1   2   3   4   5   6   7   8   9  10  11  12
## 1952    1   2   3   4   5   6   7   8   9  10  11  12
## 1953    1   2   3   4   5   6   7   8   9  10  11  12
## 1954    1   2   3   4   5   6   7   8   9  10  11  12
## 1955    1   2   3   4   5   6   7   8   9  10  11  12
## 1956    1   2   3   4   5   6   7   8   9  10  11  12
## 1957    1   2   3   4   5   6   7   8   9  10  11  12
## 1958    1   2   3   4   5   6   7   8   9  10  11  12
## 1959    1   2   3   4   5   6   7   8   9  10  11  12
## 1960    1   2   3   4   5   6   7   8   9  10  11  12
```

```
#12.Make the dataset to stationary ie. constant mean and variance and plot it.
#a.      log(dataset)
#b.      for Stationary mean (diff(log(dataset)))
#a.
log_datasets<-log(AirPassengers)
plot(log_datasets)
```
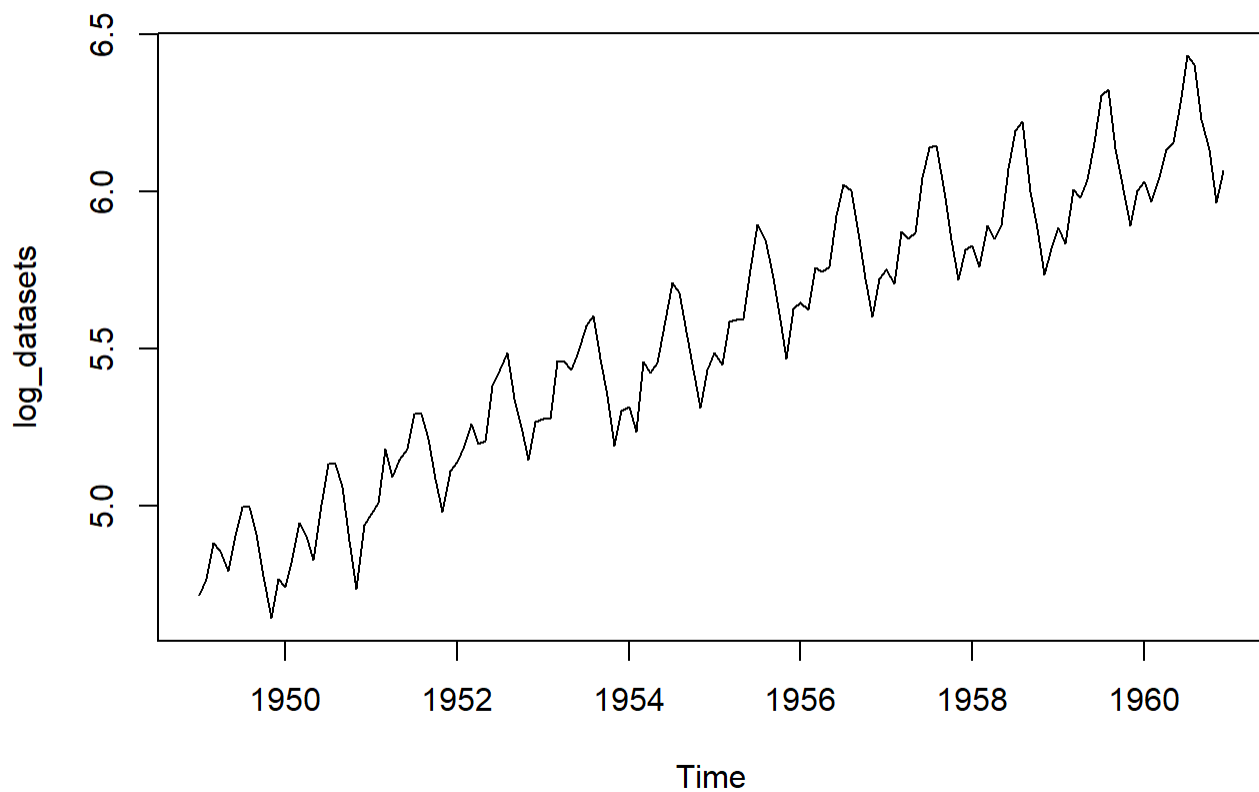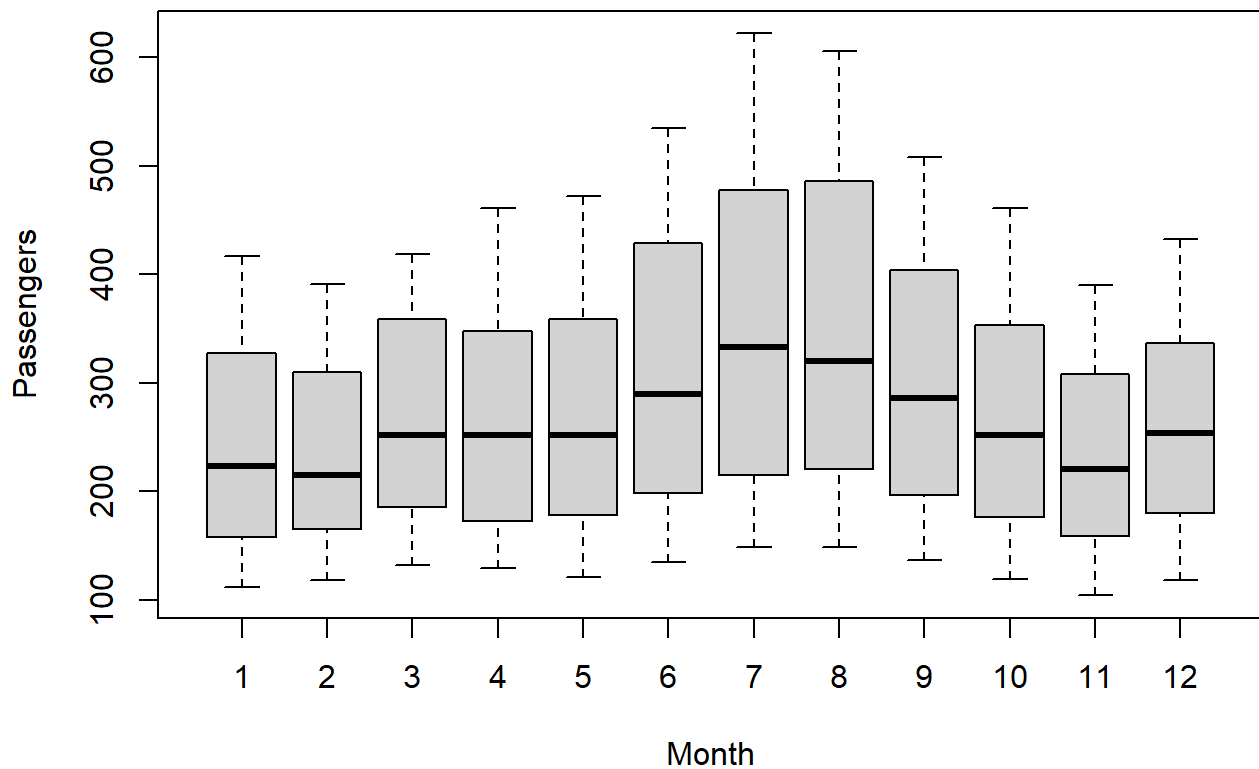
```
#b.
diff_airpassengers<-diff(AirPassengers)
plot(diff_airpassengers)
```
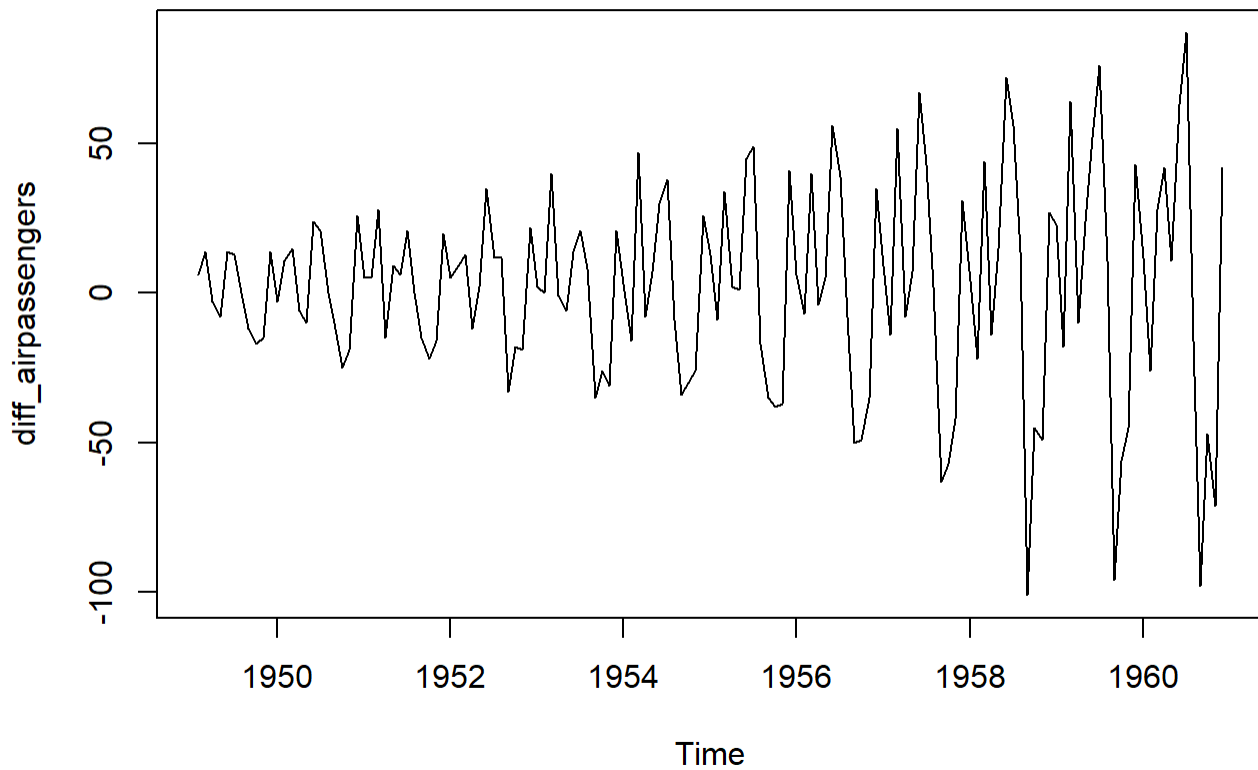


```
#13.Plot box plot across months for seasonal effect (boxplot(dataset~cycle(dataset))
boxplot(AirPassengers~cycle(AirPassengers),xlab = "Month",ylab="Passengers",main="Sesonal eff
ects of month")
```

Sesonal effects of month


```
#14. Draw a box plot for each month ie. Jan, Feb..Dec (boxplot)
months<-cycle(AirPassengers)
boxplot(AirPassengers~months,,xlab = "Month",ylab="Passengers",main="boxplot for each month i
e. Jan, Feb..Dec ")
```

boxplot for each month ie. Jan, Feb..Dec