21BDS0340

Abhinav Dinesh Srivatsa

Exploratory Data Analysis Lab

## Experiment 7.1

**Code:**

```
library(lubridate)

setwd("~/College Work/Year 4 Semester 1 (Sem 7)/Exploratory Data Analysis
Lab/Experiment 7-1")
```

**Output:**

```
> library(lubridate)
>
> setwd("~/College Work/Year 4 Semester 1 (Sem 7)/Exploratory Data Analysis
Lab/Experiment 7-1")
```

**Code:**

```
# 1. loading the data
data = read.csv("airpassengers.csv")
data$Month = as.Date(paste0(data$Month, "-01"), format = "%Y-%m-%d")
```

**Output:**

```
> # 1. loading the data
> data = read.csv("airpassengers.csv")
> data$Month = as.Date(paste0(data$Month, "-01"), format = "%Y-%m-%d")
```

**Code:**

```
# 2. structure and data types of data
head(data)
typeof(data$Month)
typeof(data$X.Passengers)
```

**Output:**

```
> # 2. structure and data types of data
> head(data)
       Month X.Passengers
1 1949-01-01          112
2 1949-02-01          118
3 1949-03-01          132
4 1949-04-01          129
5 1949-05-01          121
6 1949-06-01          135
> typeof(data$Month)
[1] "double"
> typeof(data$X.Passengers)
[1] "integer"
```

**Code:**

```
# 3. checking for missing values in the data
sum(is.na(data))
```

**Output:**

```
> # 3. checking for missing values in the data
> sum(is.na(data))
[1] 0
```

**Code:**

```
# 4. checking start and end date
min(data$Month)
max(data$Month)
```

**Output:**

```
> # 4. checking start and end date
> min(data$Month)
[1] "1949-01-01"
> max(data$Month)
[1] "1960-12-01"
```

**Code:**

```
# 5. checking frequency of the data
frequency(data)
```

**Output:**

```
> # 5. checking frequency of the data
> frequency(data)
[1] 1
```

**Code:**

```
# 6. checking summary of the data
summary(data)
```

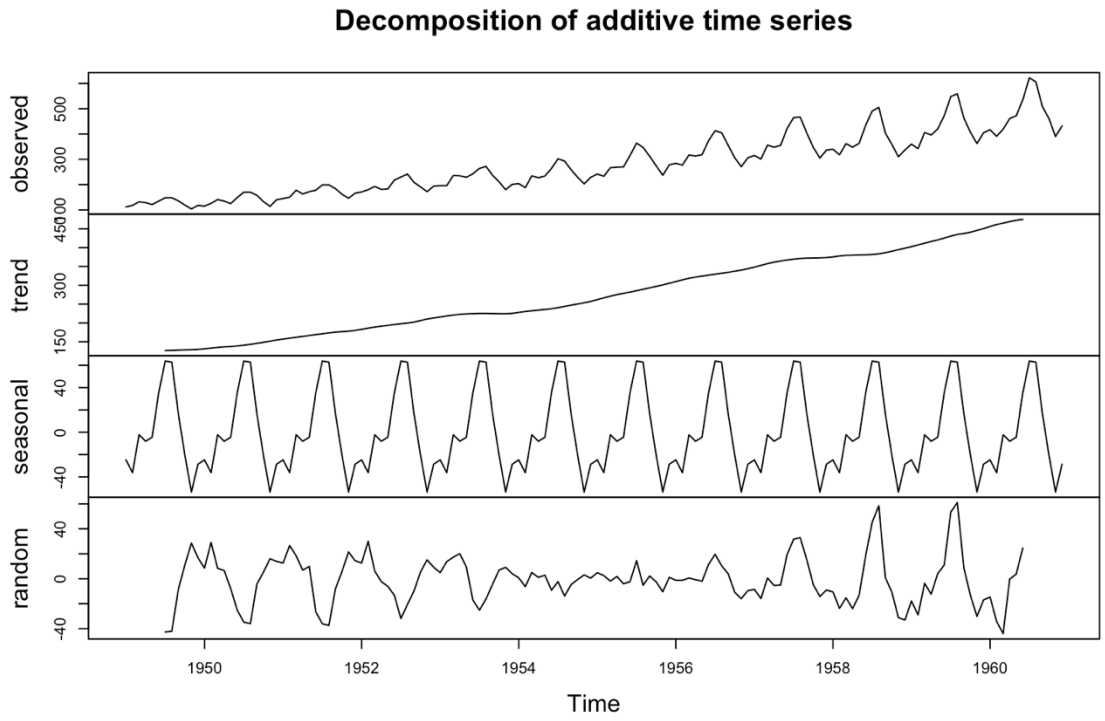
**Output:**

```
> # 6. checking summary of the data
> summary(data)
     Month             X.Passengers
 Min.   :1949-01-01   Min.   :104.0
 1st Qu.:1951-12-24   1st Qu.:180.0
 Median :1954-12-16   Median :265.5
 Mean   :1954-12-16   Mean   :280.3
 3rd Qu.:1957-12-08   3rd Qu.:360.5
 Max.   :1960-12-01   Max.   :622.0
```

**Code:**

```
# 7. plotting with decompose
ts.data = ts(data$X.Passengers, start = c(1949, 1), frequency = 12)
plot(decompose(ts.data))
```

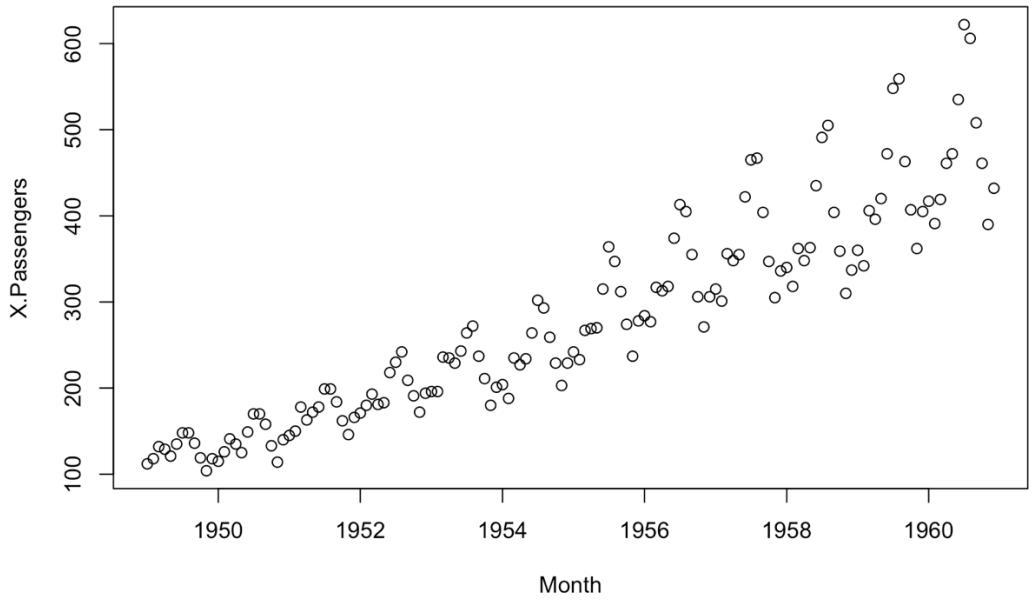
**Output:**




**Code:**

```
# 8. plotting the data
plot(data)
```

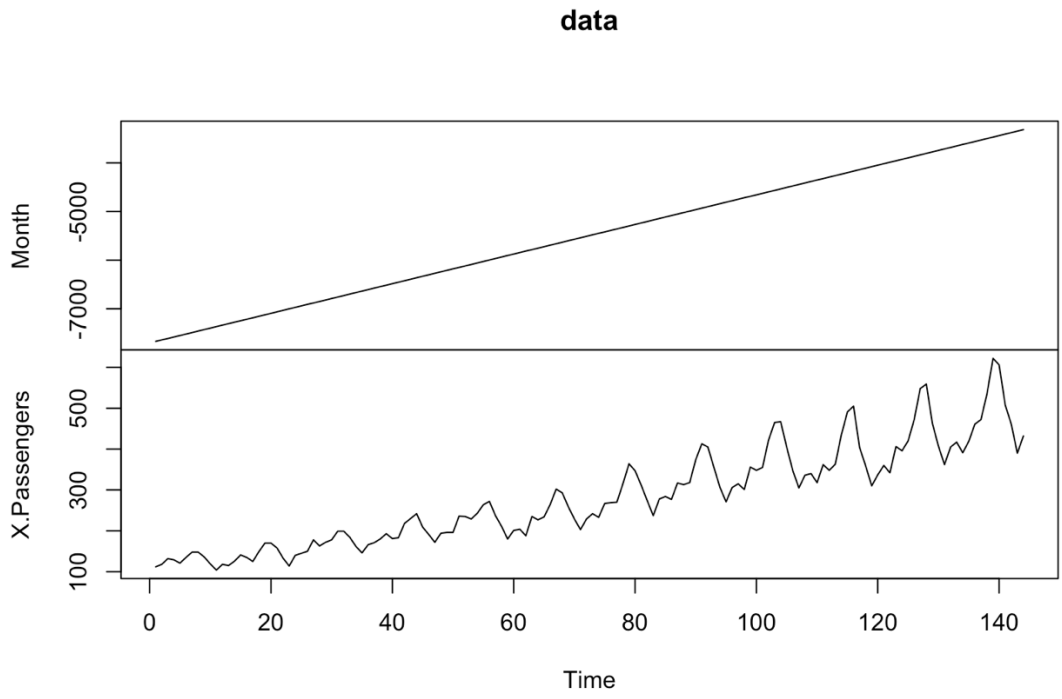
**Output:**




**Code:**

```
# 9. plotting the time series of the data
plot.ts(data)
```

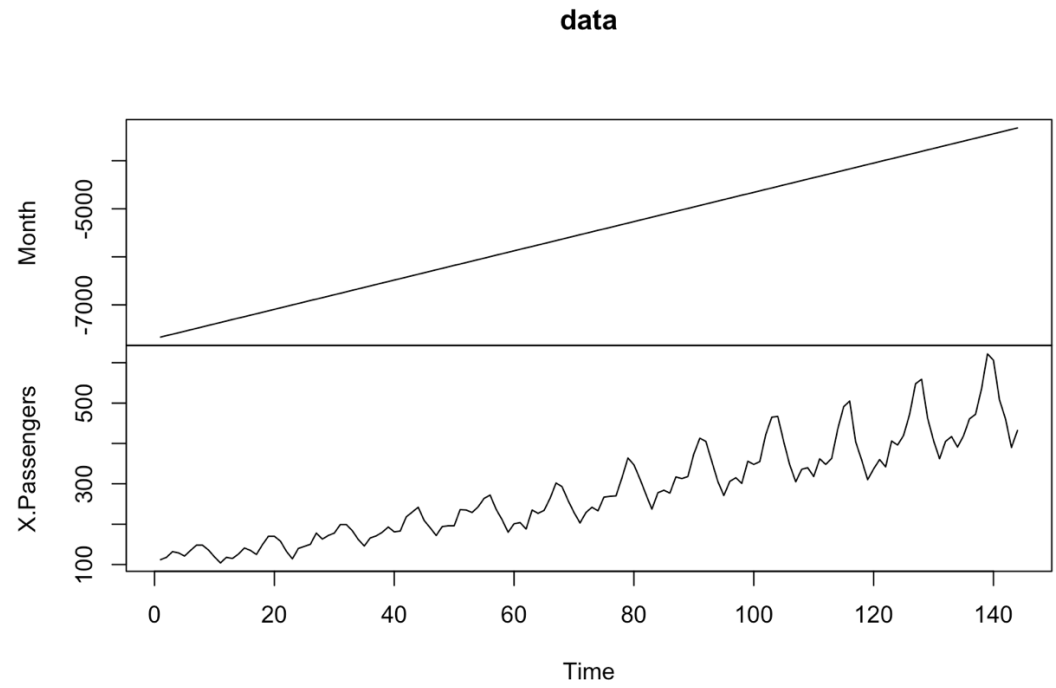
**Output:**




**Code:**

```
# 10. regression line for the data
abline(lm(data$X.Passengers~data$Month))
```

**Output:**




**Code:**

```
# 11. cycles for the data
cycle(ts.data)
```

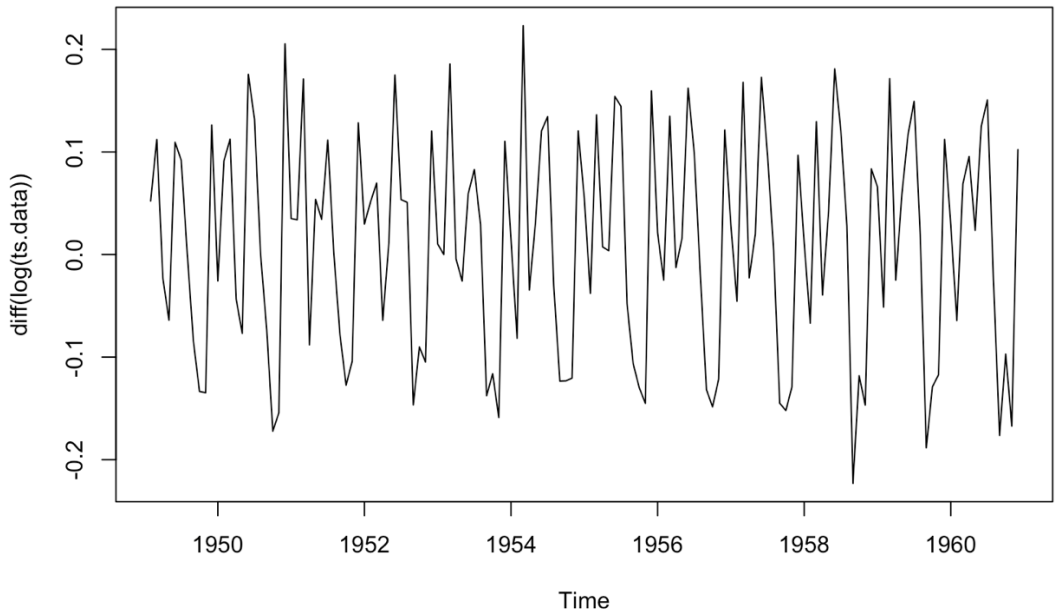
**Output:**

```
> # 11. cycles for the data
> cycle(ts.data)
     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
```

**Code:**

```
# 12. making the data stationary and plotting it
plot(log(ts.data))
plot(diff(log(ts.data)))
```

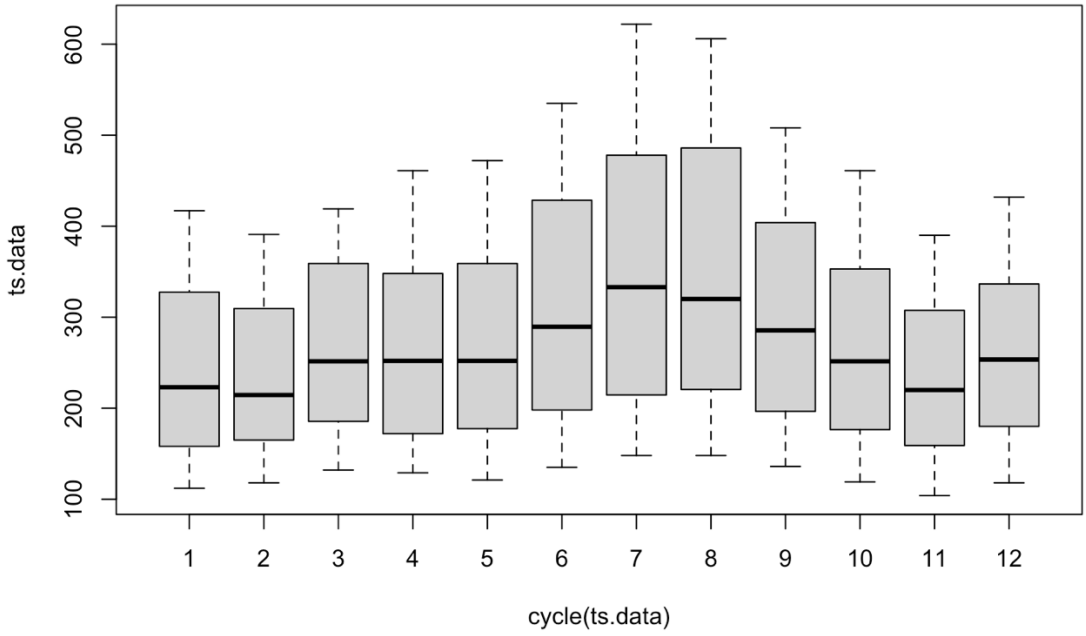
**Output:**




**Code:**

```
# 13. box plot
boxplot(ts.data~cycle(ts.data))
```

**Output:**


ts.data
100
200
300
400
500
600
1
2
3
4
5
6
7
8
9
10
11
12
cycle(ts.data)