

ts

- :

```
depart.txt      1984 1   1988 12      .  scan()      R      .  scan()
R               .
```

```
depart <- scan("https://raw.githubusercontent.com/yjyjpark/TS-with-R/main/Data/depart.txt")
```

```
depart      ts()      ts      .
```

```
depart.ts <- ts(depart, start = c(1984, 1), frequency = 12)
```

```
depart.ts
```

```
##      Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec
## 1984  423  458  607  564  536  536  804  540  488  627  672  1447
## 1985  514  518  699  654  612  612  884  605  547  705  698  1555
## 1986  561  564  773  717  665  667  994  661  616  786  806  1754
## 1987  622  636  874  831  769  779  1142  764  718  930  943  2039
## 1988  736  752  1057  947  868  931  1311  896  867  1073  1069  2333
```

- :

```
depart.ts      Figure 1      .
```

```
library(fpp2)
autoplot(depart.ts) +
  labs(title = "Monthly sales of a department store",
       x = "Year", y = NULL)
```

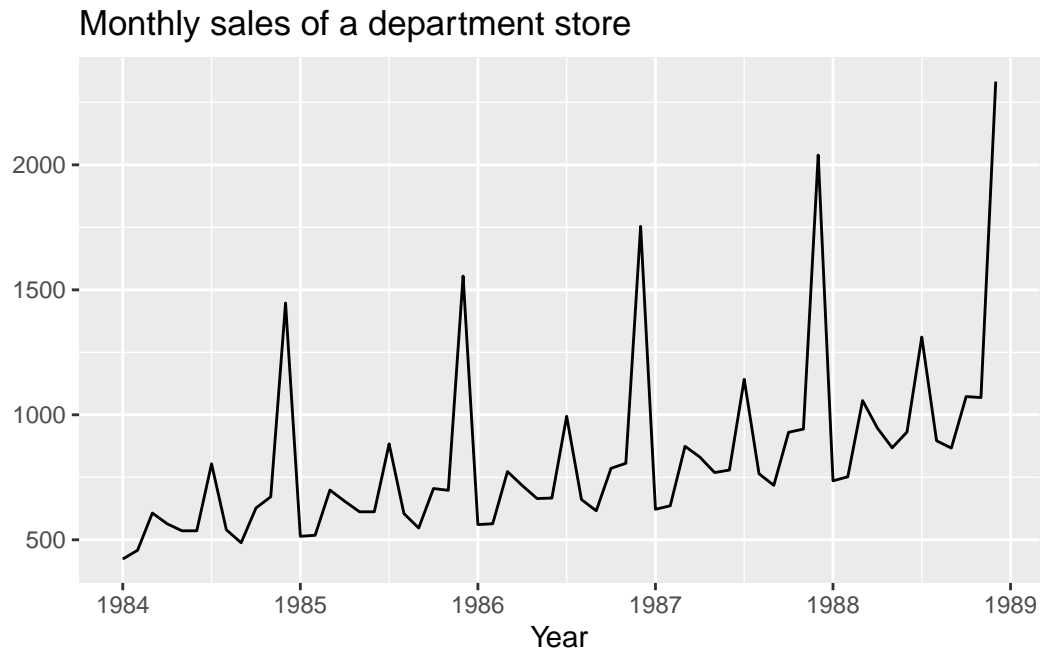


Figure 1:

• :

1856 1 2005 12 global.txt . Figure 2 .

```
global <- scan("https://raw.githubusercontent.com/yjyjpark/TS-with-R/main/Data/global.txt")
global.ts <- ts(global, start = c(1856, 1), frequency = 12)
```

```
autoplot(global.ts) +
  labs(title = "Global Temperature 1855 ~ 2005",
       x = "Year", y = NULL)
```

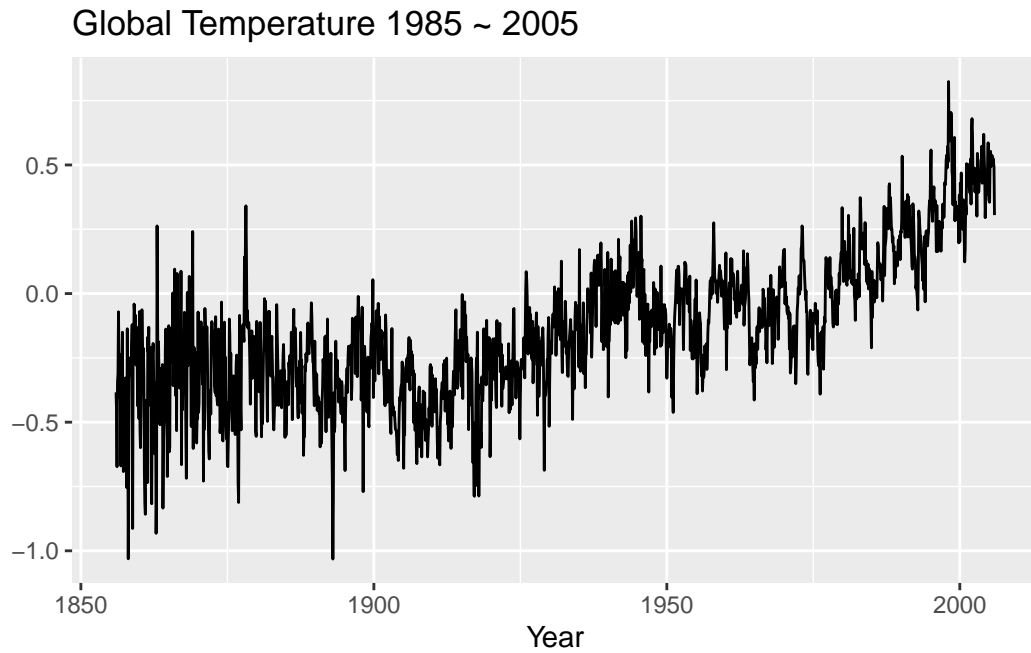


Figure 2: 1856 ~ 2005

Figure 2 1970 . 1970 . ts
 , window() .

```
global.1970 <- window(global.ts, start = 1970)
```

1970 1 Figure 3 .

```
autoplot(global.1970) +  
  labs(title = "Global Temperature 1970 ~ 2005",  
        x = "Year", y = NULL)
```

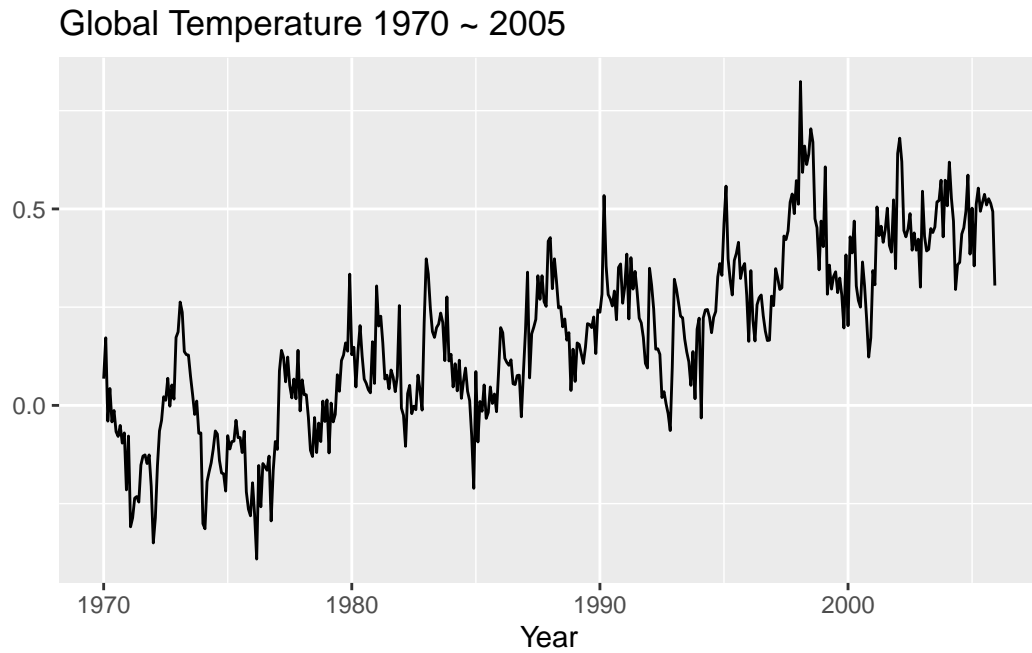


Figure 3 , . Figure 4 .

```
autoplot(global.1970) +  
  geom_smooth(method = "lm", se = FALSE) +  
  labs(title = "Global Temperature 1970 ~ 2005",  
        x = "Year", y = NULL)
```

Global Temperature 1970 ~ 2005

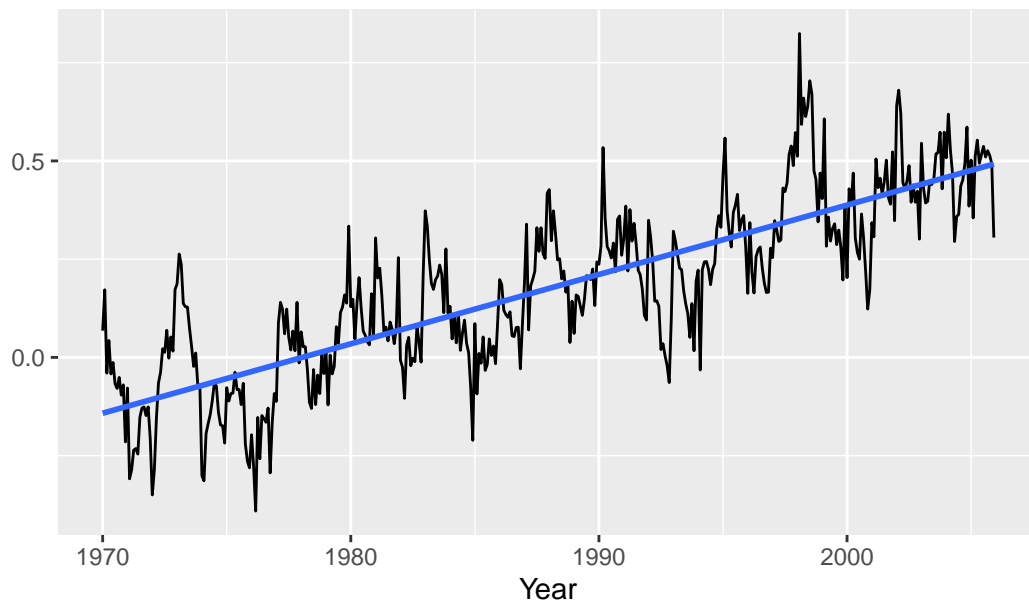


Figure 4:

- :

```
cbe.txt      1958      ,      .      ,      .
readr::read_table()
```

```
library(readr)
CBE <- read_table("https://raw.githubusercontent.com/yjyjpark/TS-with-R/main/Data/cbe.txt")
CBE %>% print(n = 3)
## # A tibble: 396 x 3
##   choc beer elec
##   <dbl> <dbl> <dbl>
## 1  1451  96.3  1497
## 2  2037  84.4  1463
## 3  2477  91.2  1648
## # ... with 393 more rows
```

```
tibble      ts      .      ts()      ts      .
```

```
cbe <- ts(CBE, start = 1958, frequency = 12)
head(CBE, n = 3)
## # A tibble: 3 x 3
```

```
##      choc  beer  elec
##      <dbl> <dbl> <dbl>
## 1    1451   96.3  1497
## 2    2037   84.4  1463
## 3    2477   91.2  1648
```

```
cbe      choc, beer elec      .      autoplot()
```

Figure 5 .

```
autoplot(cbe) + ylab(NULL)
```

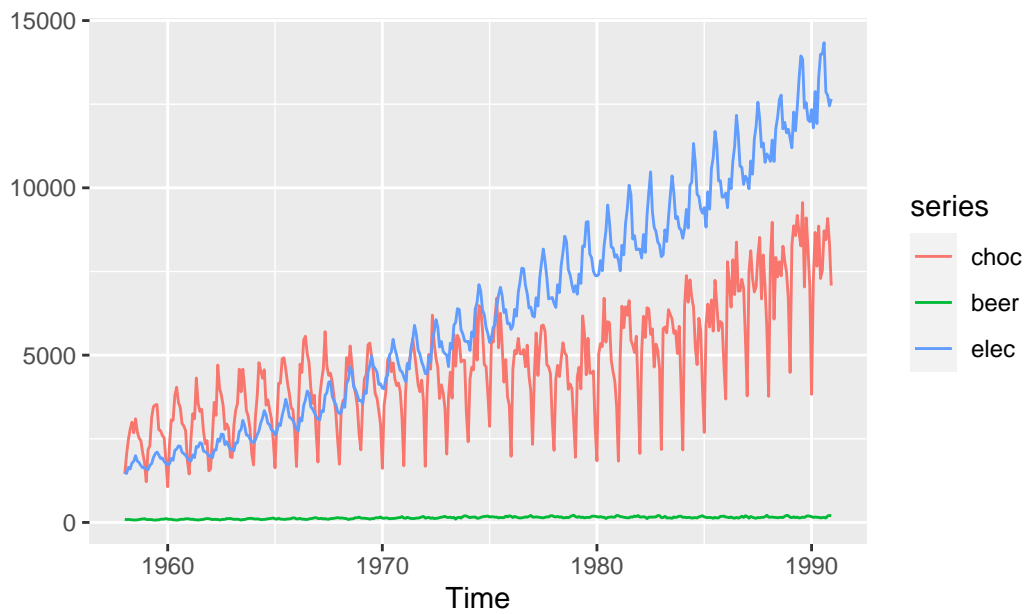


Figure 5:

```
scale      facet      . Facet
```

Figure 6 .

```
autoplot(cbe, facets = TRUE) + ylab(NULL)
```

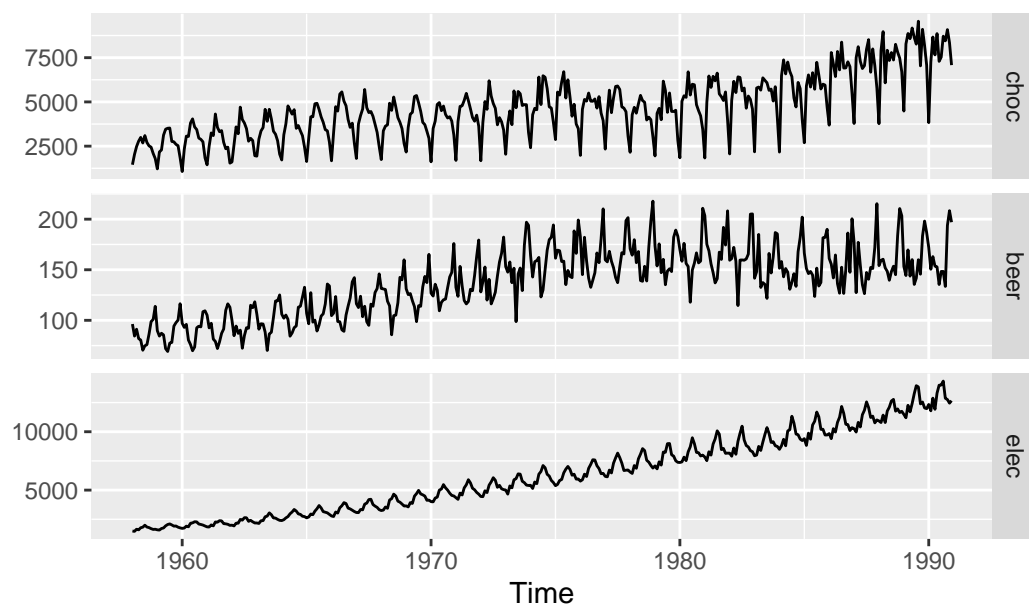


Figure 6:

Seasonal

- : AirPassengers

`ggseasonplot()` seasonal Figure 7 .

```
ggseasonplot(AirPassengers)
```

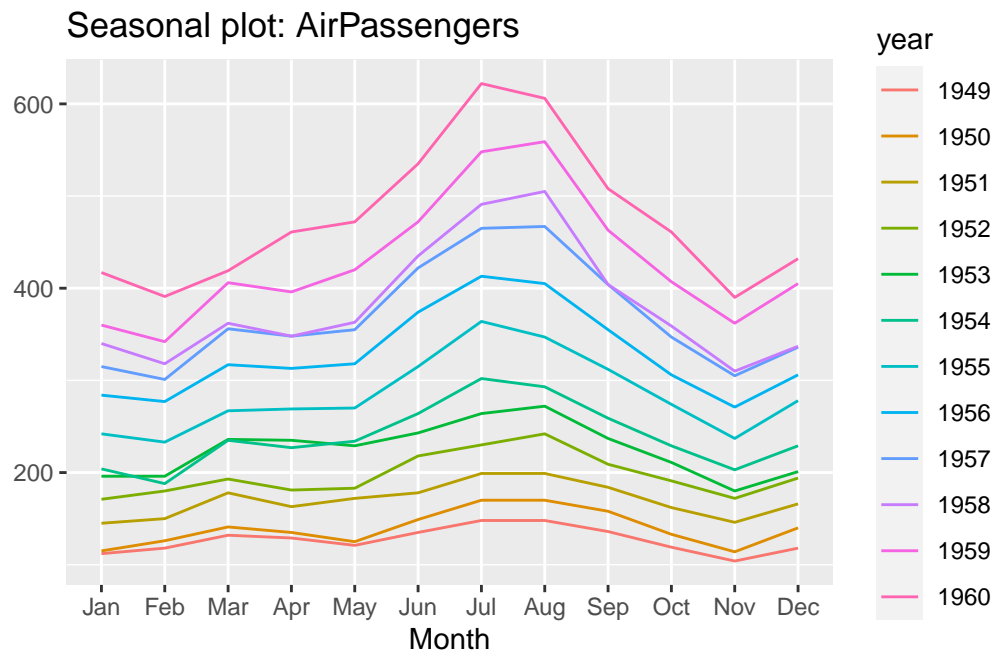


Figure 7: `ggseasonalplot()` seasonal

seasonal Figure 8 .

```
ggseasonplot(AirPassengers, year.labels = TRUE)
```


Seasonal plot: AirPassengers

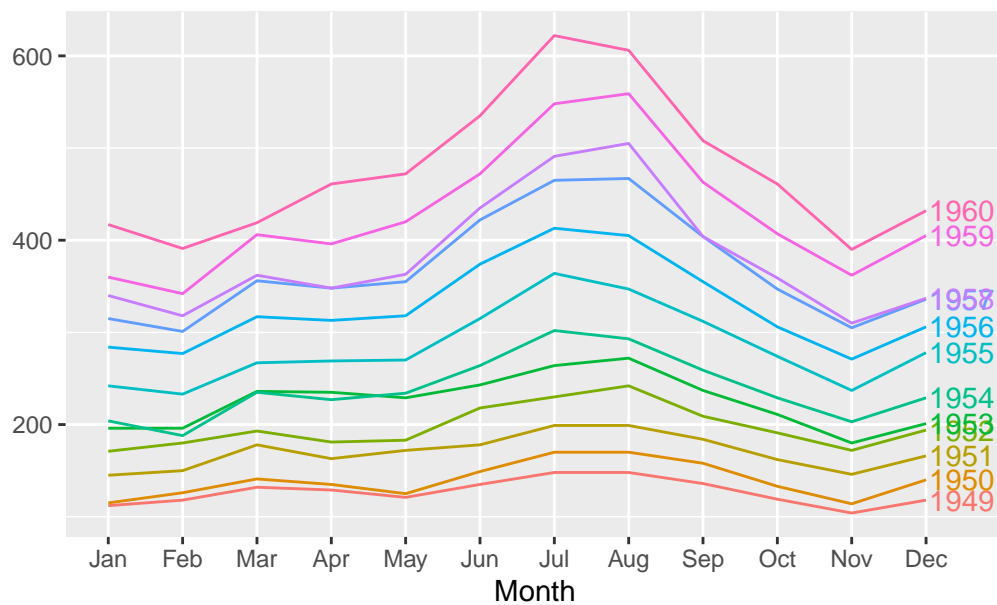


Figure 8: `ggseasonalplot()` seasonal

seasonal Figure 9 .

```
ggseasonplot(AirPassengers,
             year.labels = TRUE, year.labels.left = TRUE)
```

Seasonal plot: AirPassengers

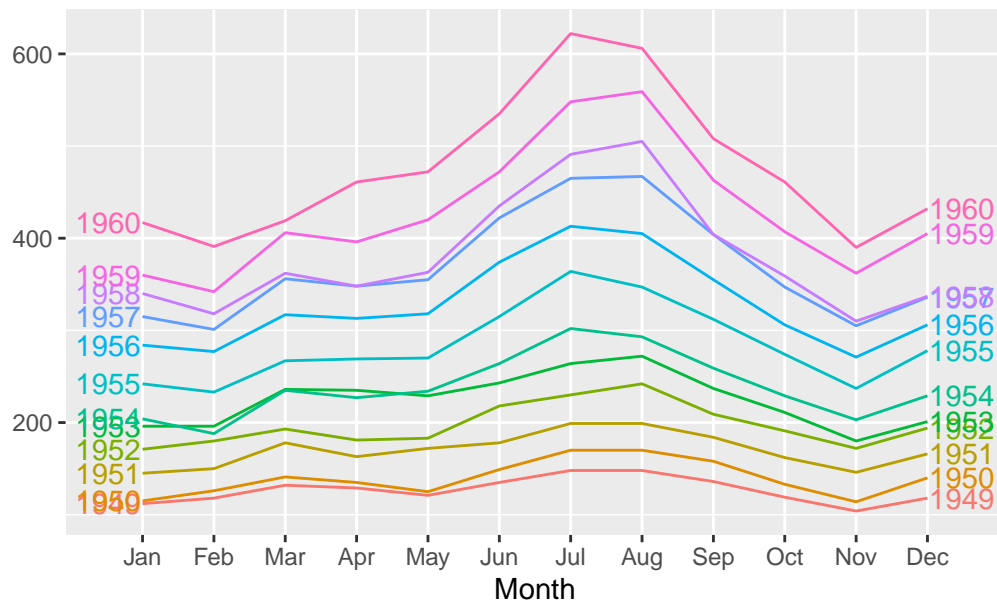


Figure 9: `ggseasonalplot()` `year.labels.left = TRUE` seasonal

seasonal Figure 10 .

```
ggseasonplot(AirPassengers, polar = TRUE)
```

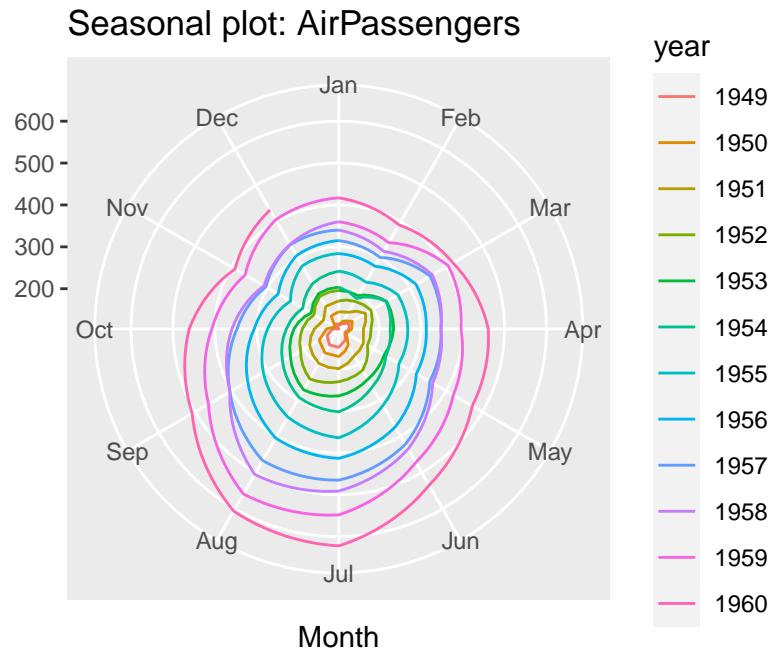


Figure 10: `ggseasonalplot()` `polar = TRUE` `seasonal`

`ggsubseriesplot()` Figure 11 . , .

`ggsubseriesplot(AirPassengers)`

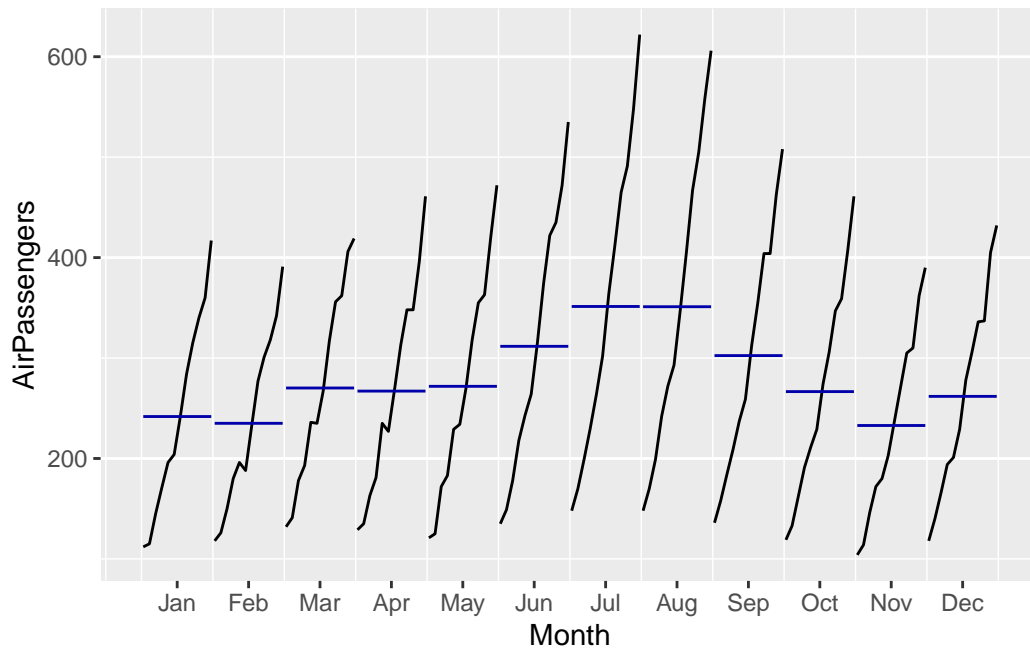


Figure 11: `ggsubseriesplot()` seasonal

Figure 12

```
tibble(AP = as.numeric(AirPassengers),
        mon = as.factor(cycle(AirPassengers))) %>%
  ggplot(aes(x = mon, y = AP)) +
  geom_boxplot() +
  labs(x = "Month", y = "Air Passengers")
```

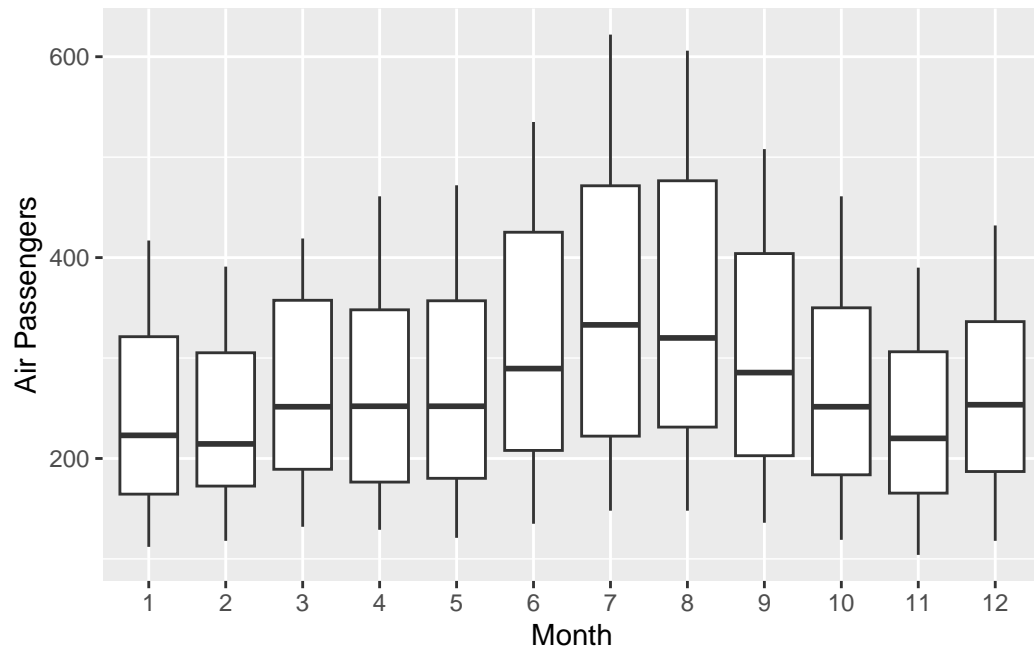


Figure 12:

1. `depart.ts` seasonal , .

