Solution: Beer supply data

Explorative analysis of beer supply data

Read in the monthly beer supply data from the book website, and save it as a vector called `beerdata`:

```
www <- "http://asta.math.aau.dk/eng/static/datasets?file=cbe.dat"
CBEdata <- read.table(www, header = TRUE)
beerdata <- CBEdata$beer
```

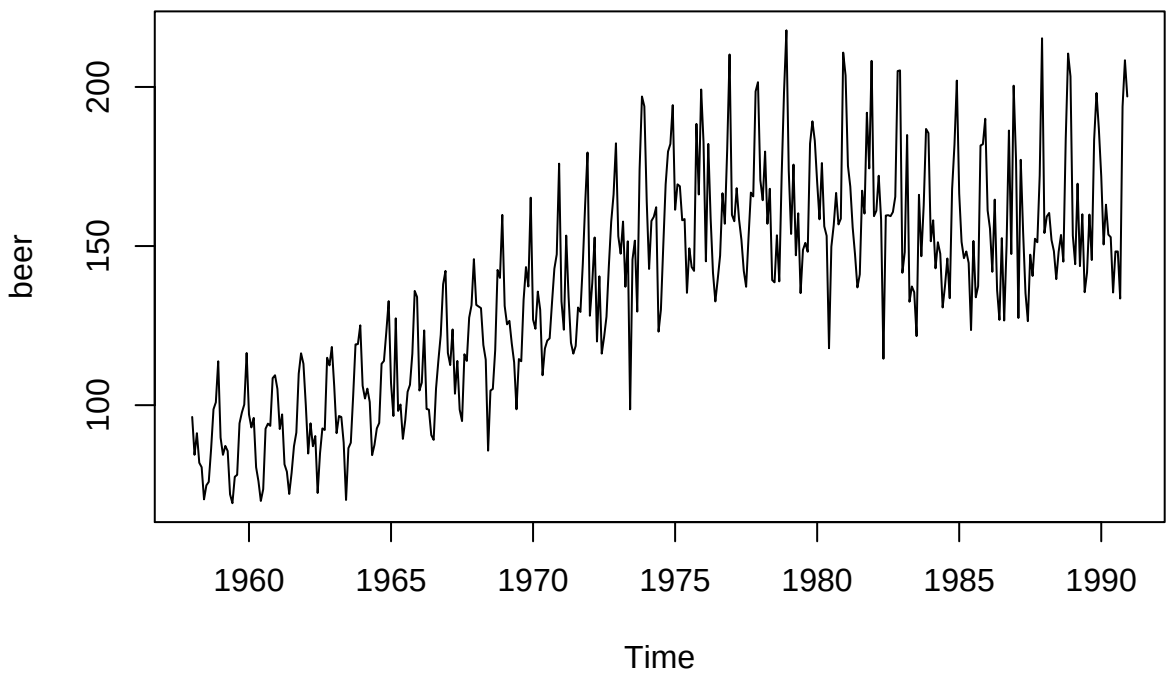
Now convert it to a time series object (`ts`) with the correct starting date (Jan. 1958) and frequency and call it `beer`:

```
beer <- ts(beerdata, start = 1958, freq = 12)
```

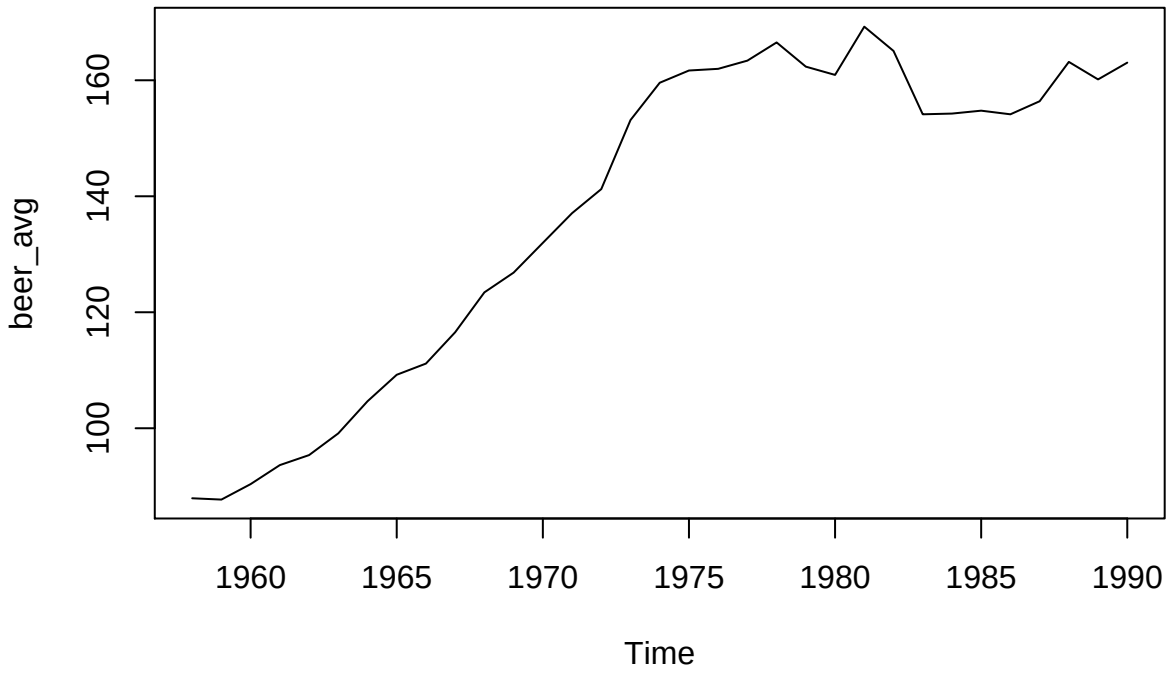
Now perform an explorative analysis like in the lecture:

- Plot the data, plot the aggregated yearly data and make a boxplot of the observations for each of the twelve months. Comment on the figures.

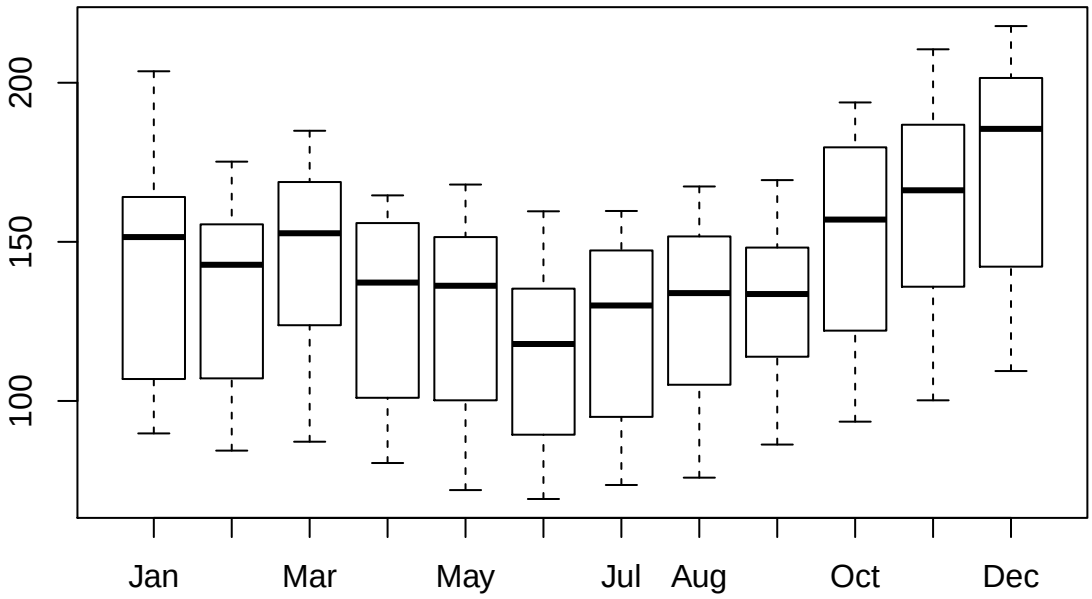
```
plot(beer)
```




```
beer_avg <- aggregate(beer, FUN = mean)
plot(beer_avg)
```

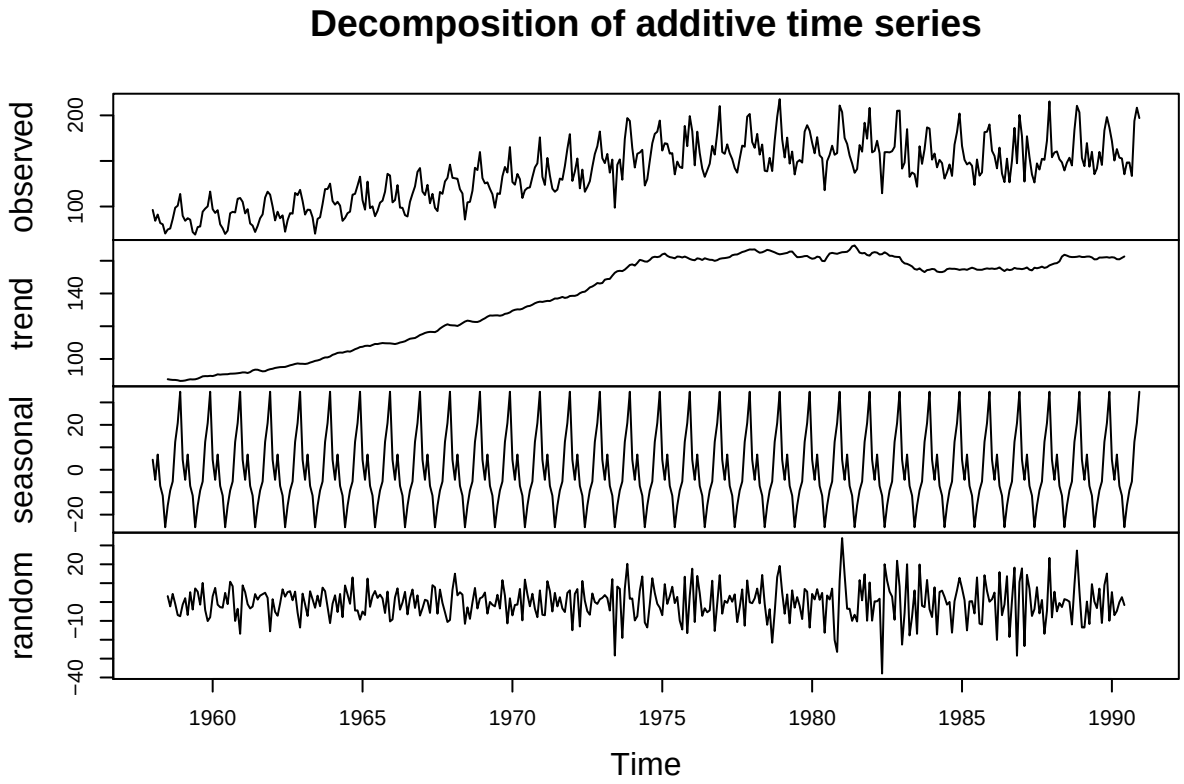



```
beer_month <- factor(cycle(beer), labels = month.abb)
boxplot(beer ~ beer_month)
```

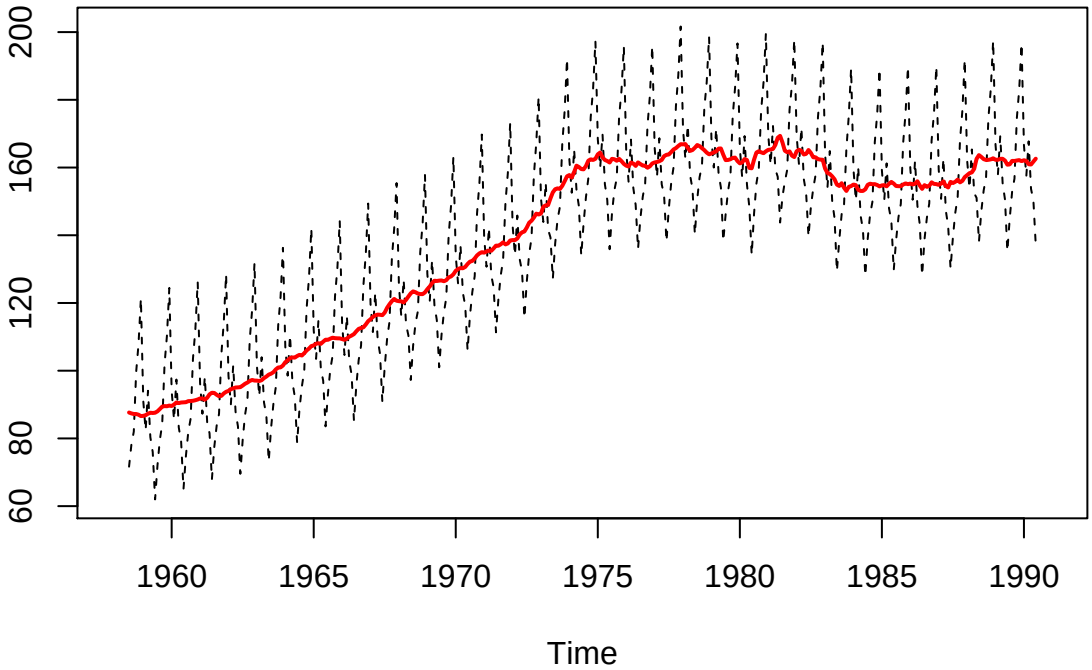


- Use `decompose` to decompose the series into trend, seasonal and random component, and make relevant figures and comment on them. Try also to use `ts.plot` to plot the seasonal component on top of the trend (you can set argument `lty = c(1,2)` to plot with different line styles for the two series).

```
d <- decompose(beer)
plot(d)
```

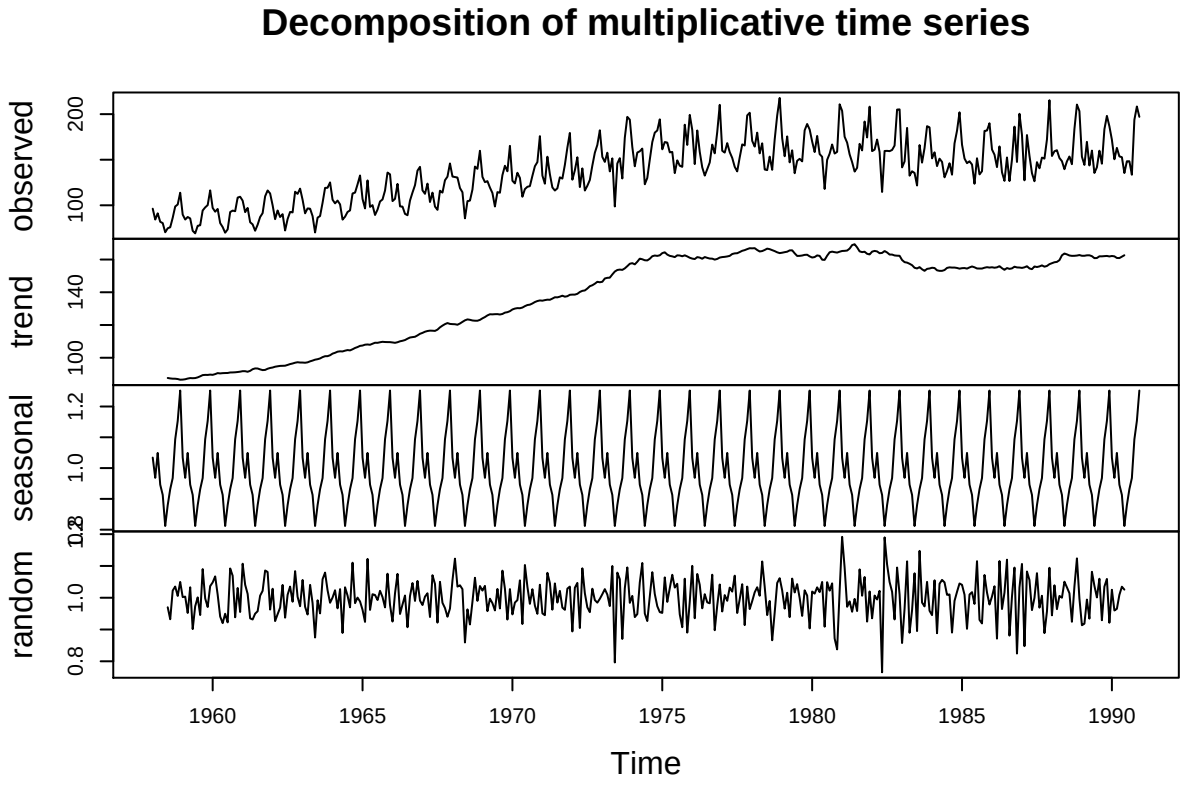



```
m <- d$trend
s <- d$season
ts.plot(m+s, m, lty = c(2,1), lwd = c(1,2), col = c("black", "red"))
```



- Repeat the steps above for a multiplicative model for the decomposition (use `decompose(beer, "mult")`) and repeat the figures for that (now you should multiply `trend`, `seasonal` and `random` to recover the original series).

```
d_mult <- decompose(beer, type = "mult")
plot(d_mult)
```




```
m_mult <- d_mult$trend
s_mult <- d_mult$season
ts.plot(m_mult*s_mult, m_mult, lty = c(2,1), lwd = c(1,2), col = c("black", "red"))
```