# chapter1

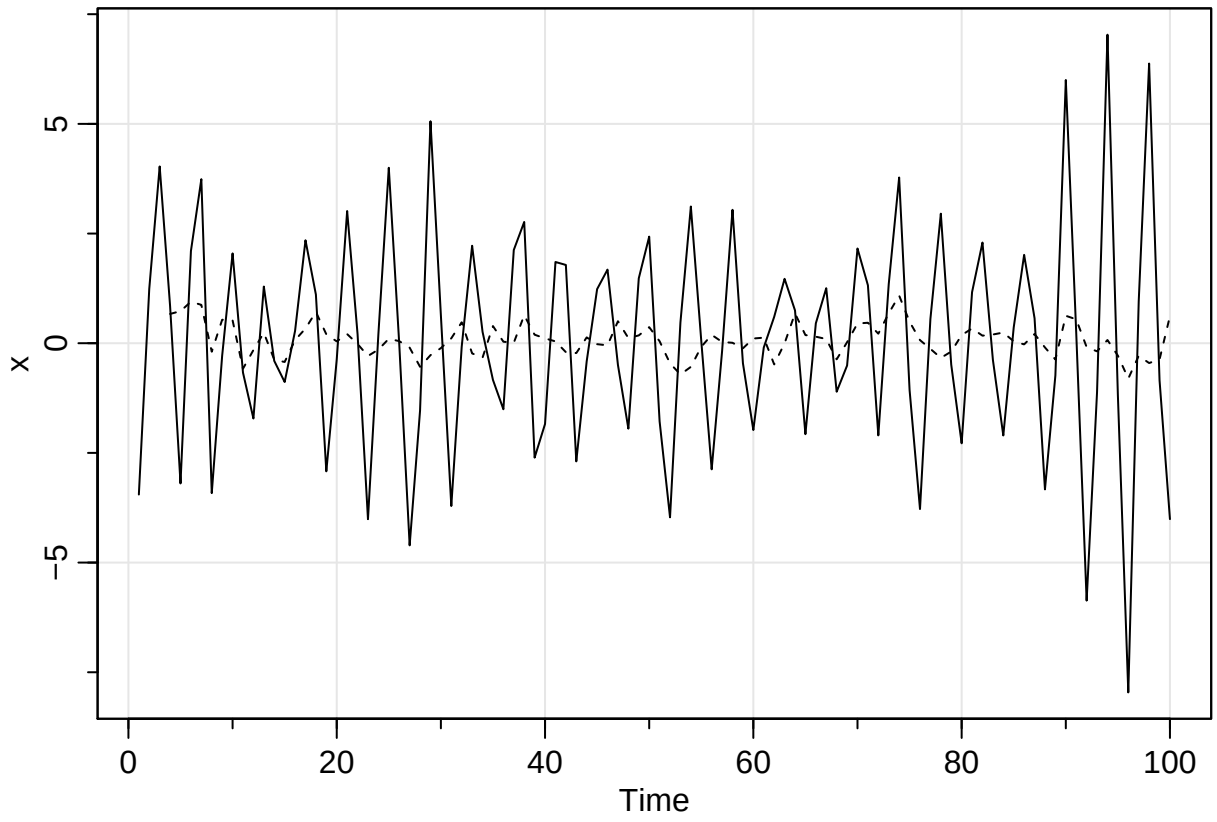
Loading libraries

```
library(astsa)
```

## Problems 1.1

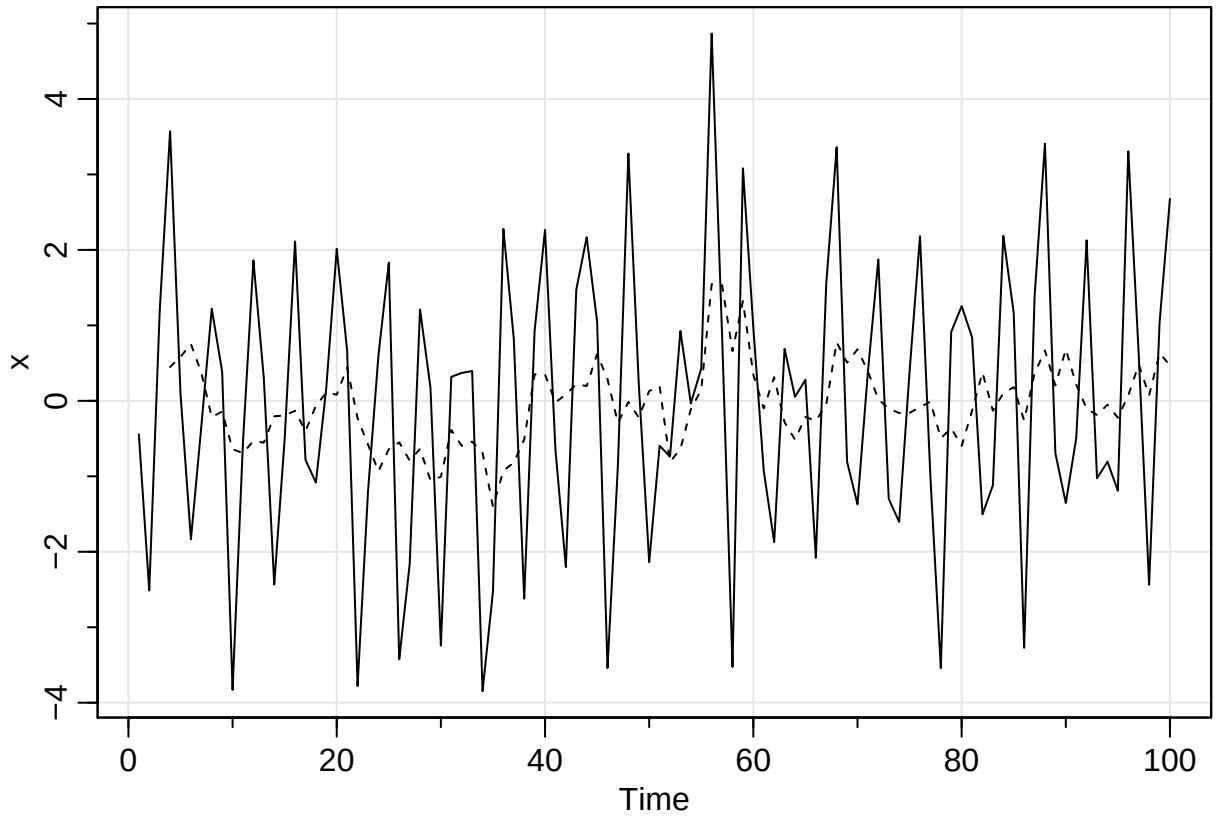
### Part a)

```
set.seed(90210)
w = rnorm(150)
x = filter(w, filter=c(0,-0.9),method="recursive")[-(1:50)]
v = filter(x,sides = 1,filter = rep(1/4,4))
tsplot(x)
lines(v,type = 'l',lty = 2)
```



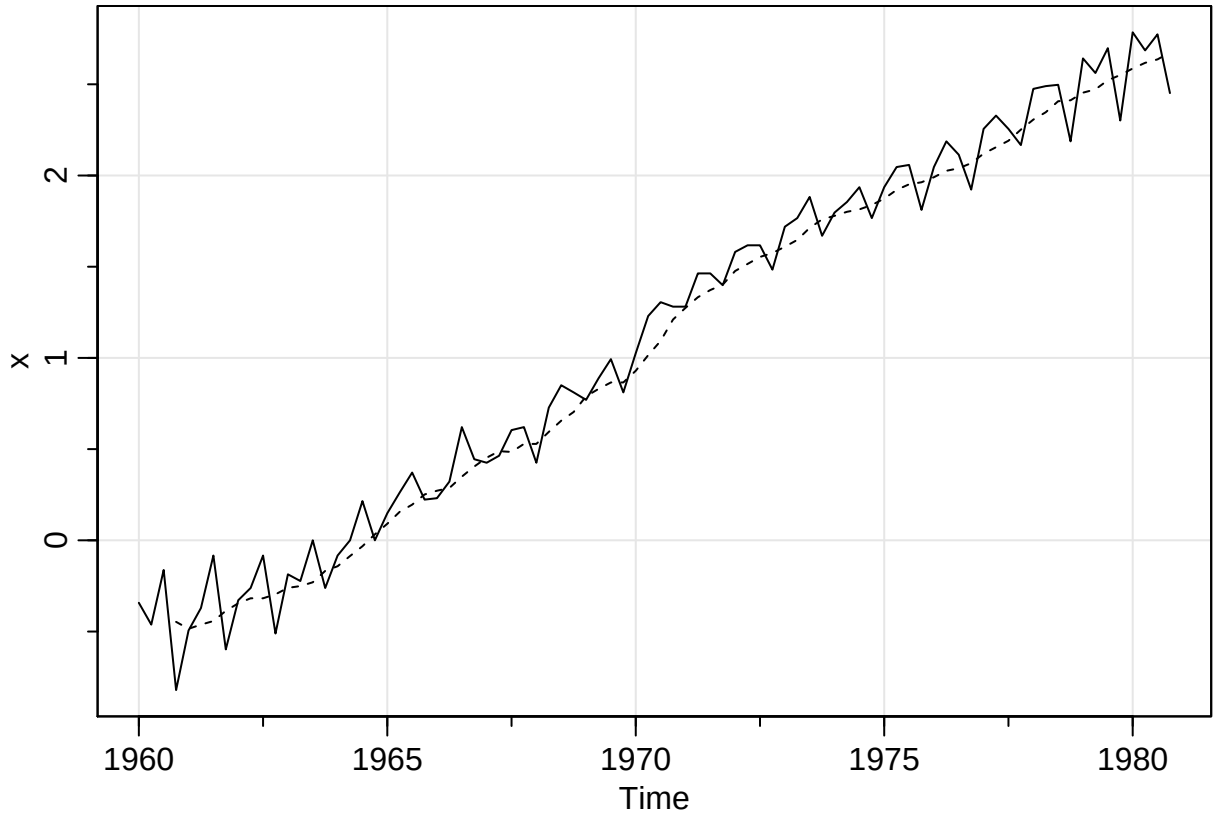
**Part b)**

```
set.seed(90210)
t = 1:100
cs = 2*cos((2*pi*t)/4)
w = rnorm(100)
x = cs + w
v = filter(x,sides = 1,filter = rep(1/4,4))
tsplot(x)
lines(v,type = 'l',lty = 2)
```




**Part c)**

```
x = log(jj)
v = filter(x,sides = 1,filter = rep(1/4,4))
tsplot(x)
lines(v,type = 'l',lty = 2)
```




**Part d)**

What is seasonal adjustment?

Seasonal adjustment is a statistical technique that attempts to measure and remove the influences of predictable seasonal patterns.

**Part e)**

The main learning from this exercise was to smooth out the noise of the time series data to better understand the trend.