

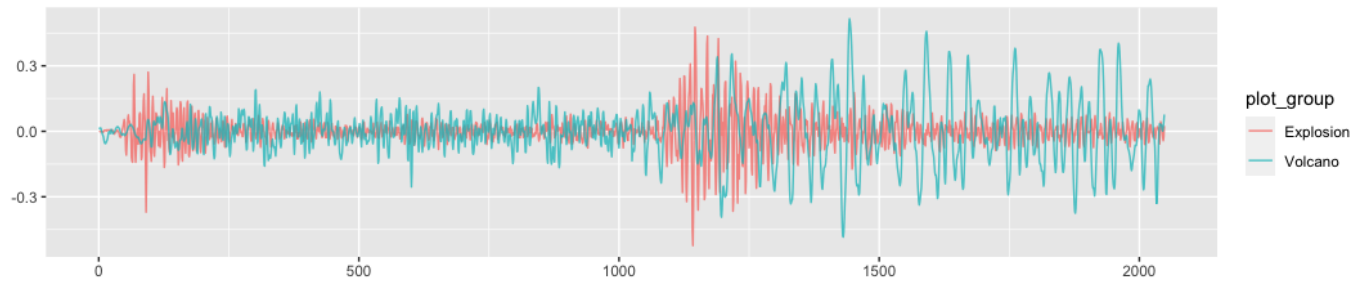
# Chapter 1 Homework Problems

## Problem 1.1

---

```
library(ggplot2)

hw1<-cbind(EXP6,EQ5)
colnames(hw1)<-c("Explosion","Volcano")
autoplot(hw1, facets = FALSE, alpha = 0.75)
```



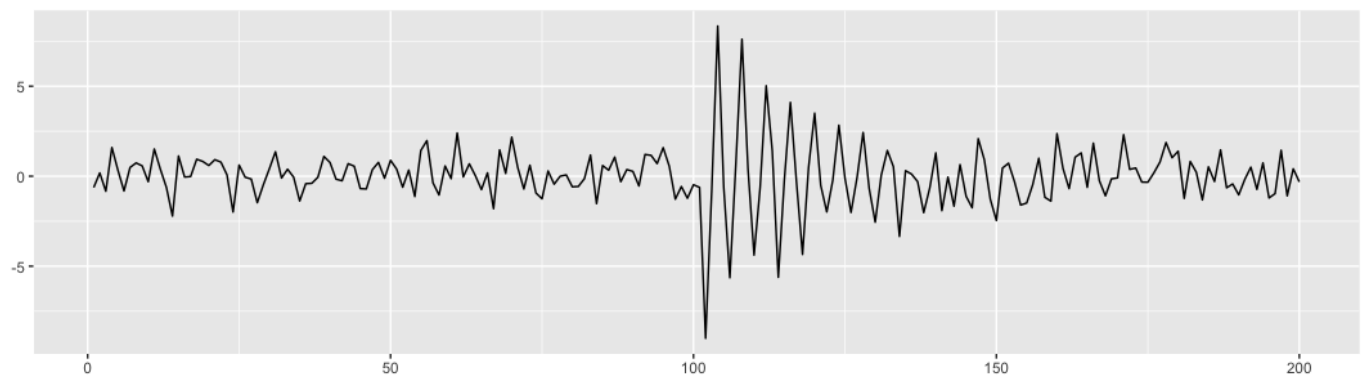
## Problem 1.2

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(a)

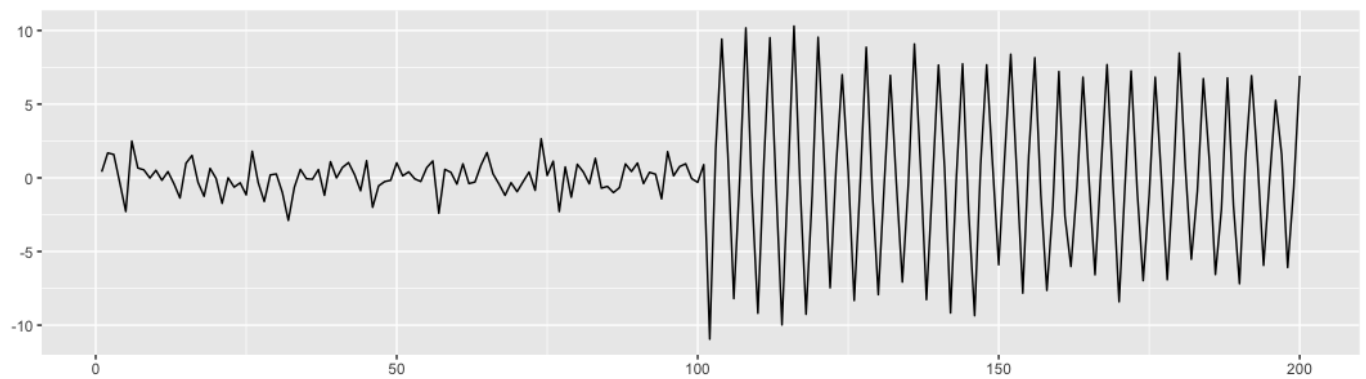
```
library(ggplot2)
library(ggfortify)
set.seed(1)

s=c(integer(100), 10*exp(-(1:100)/20)*cos(2*pi*1:100/4))
x_a=s+rnorm(200)
autoplot(as.ts(x_a))
```



(b)

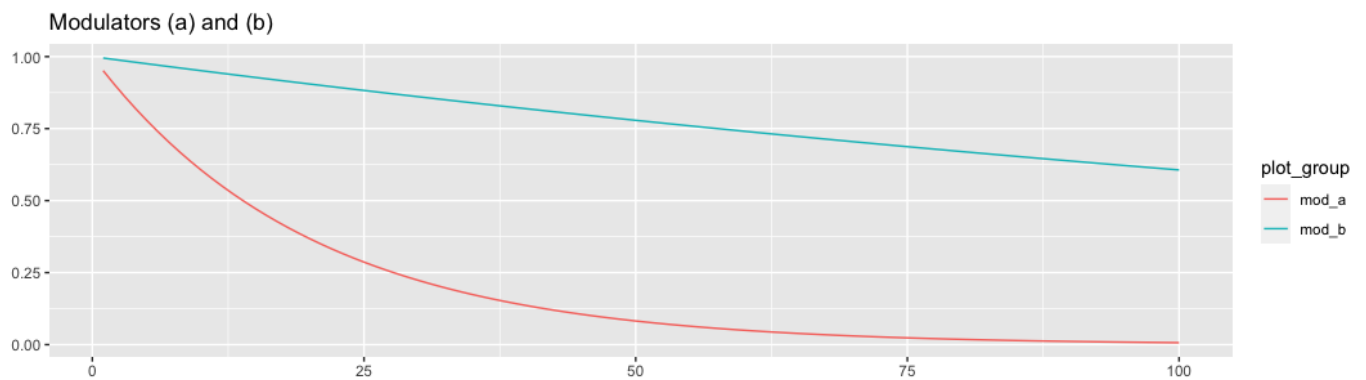
```
s=c(integer(100), 10*exp(-(1:100)/200)*cos(2*pi*1:100/4))
x_b=s+rnorm(200)
autoplot(as.ts(x_b))
```



(c)

The explosion series is similar to series **a**, and the earthquake series is similar to series **b** in their mid-to-end behavior. We see that both series **a** and the explosion series have big amplitudes in the middle that slowly become smaller and tend towards 0 but don't get there. We also see that both series **b** and the earthquake have big amplitudes throughout their mid-to-end behavior.

```
mod_a=exp(-(1:100)/20)
mod_b=exp(-(1:100)/200)
modulators<-as.ts(cbind(mod_a,mod_b))
autoplot(modulators, facets=F, main="Modulators (a) and (b)")
```



## Problem 1.3

(a)

(b)

(c)

(d)