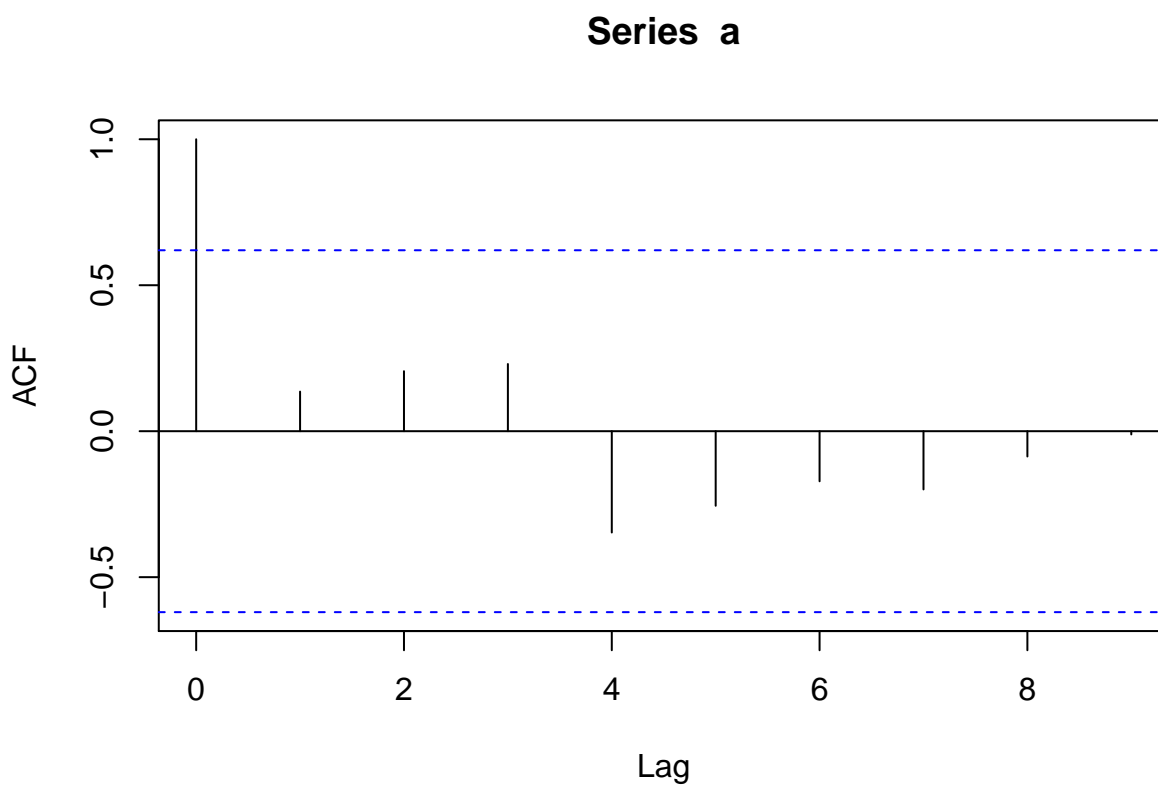# Lab1

*Claudius Taylor*

*9/1/2018*

## Generating random variables
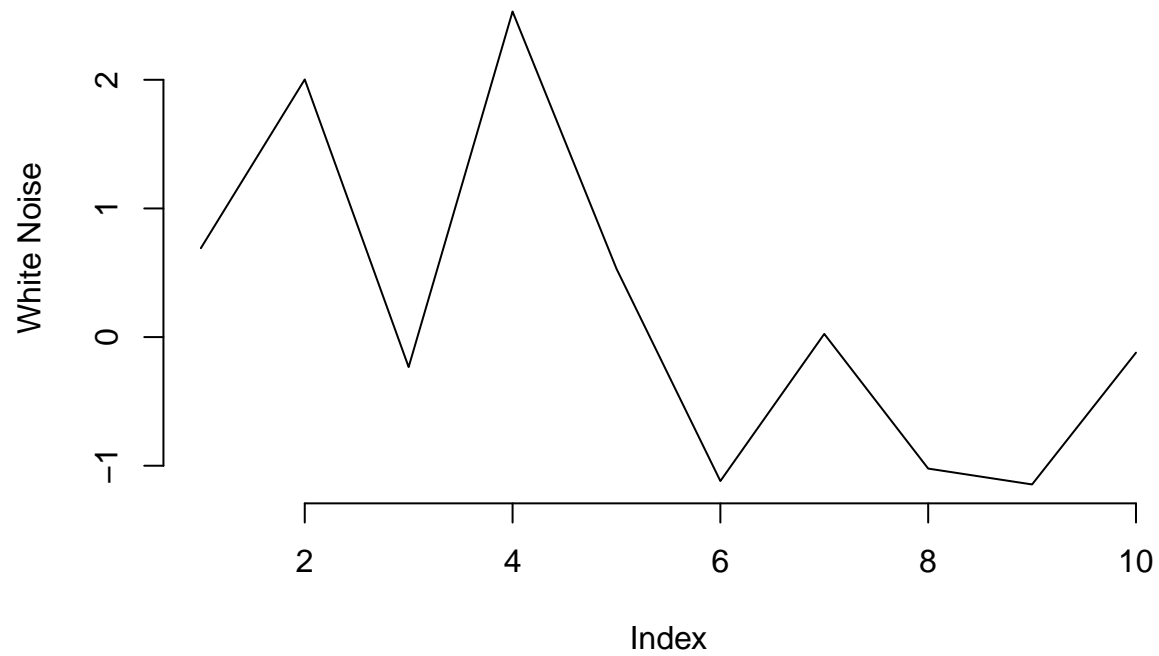
```
a <- rnorm(10,0,1)
b <- rnorm(50,0,1)
c <- rnorm(100,0,1)
d <- rnorm(1000,0,1)
```

## Estimating first 10 autocovarinace, autocorrelation and plotting the trajectories and correlogram
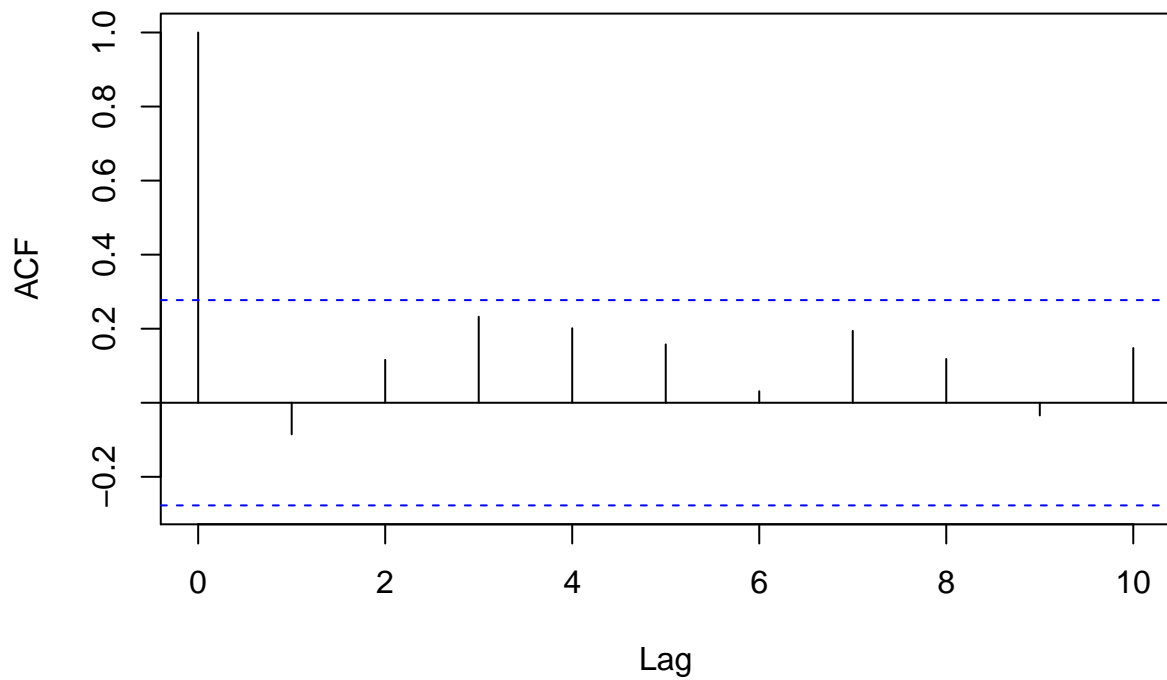
```
acf(a)
```



**Series a**

```
plot(a,type='l',ylab="White Noise",frame.plot=FALSE)
```
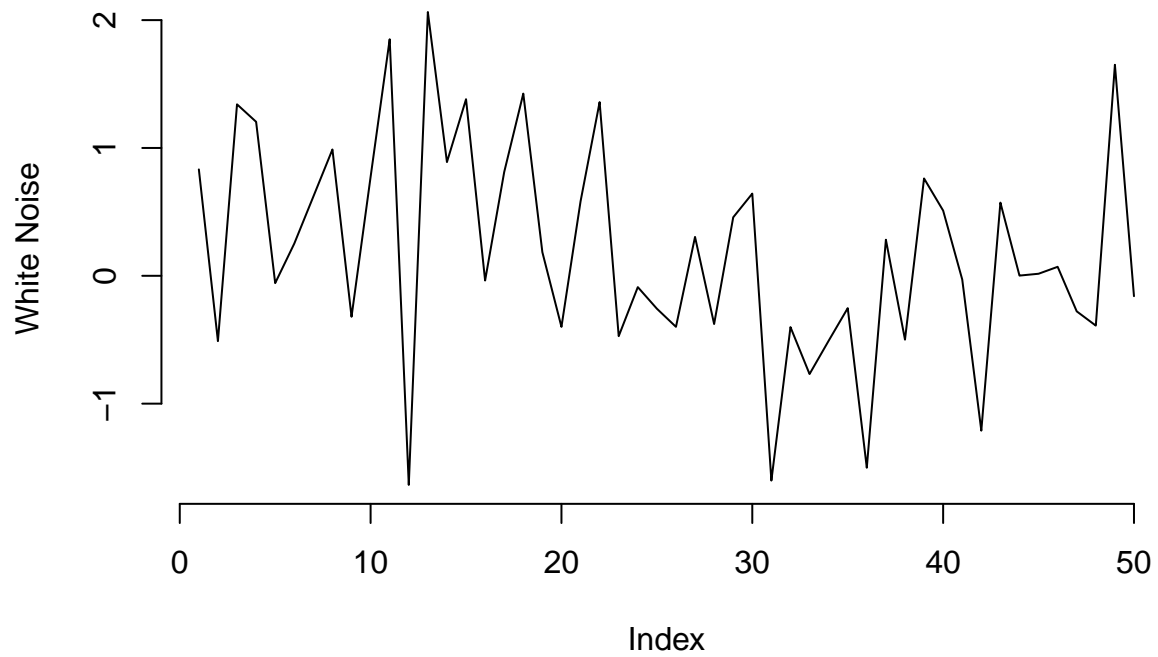


```
acf(b,10)
```
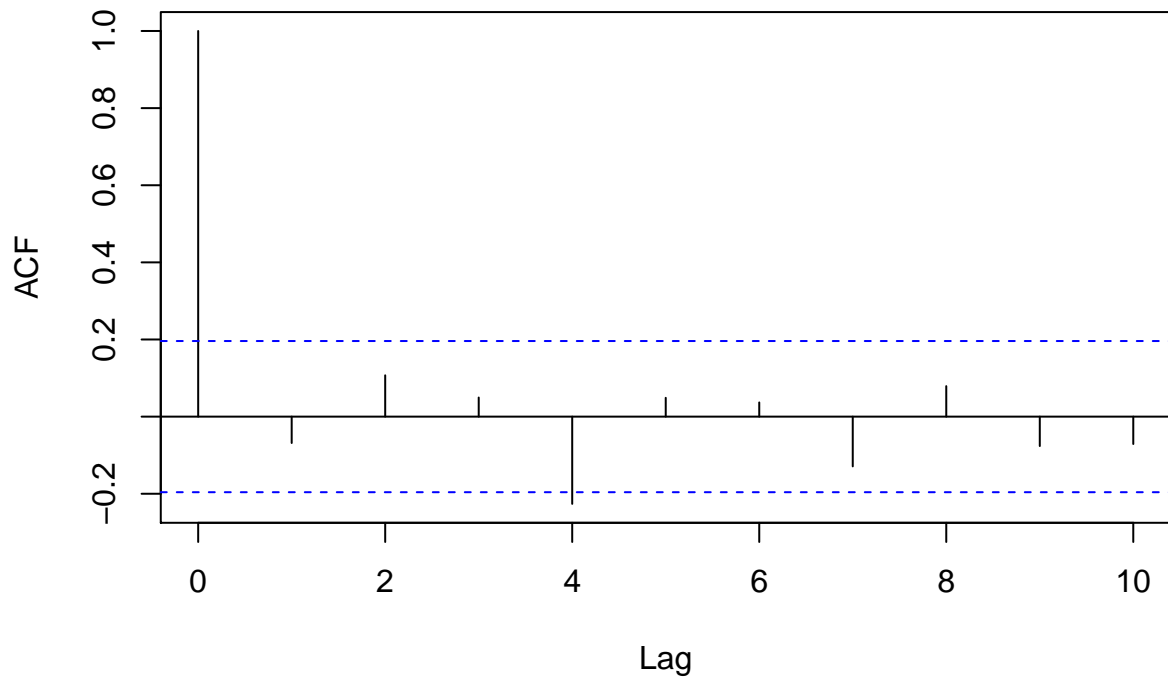
**Series b**



```
plot(b,type='l',ylab="White Noise",frame.plot=FALSE)
```

```r
acf(c,10)
```

**Series c**



```r
plot(c,type='l',ylab="White Noise",frame.plot=FALSE)
```

```r
acf(d,10)
```

**Series  d**



```r
plot(d,type='l',ylab="White Noise",frame.plot=FALSE)
```
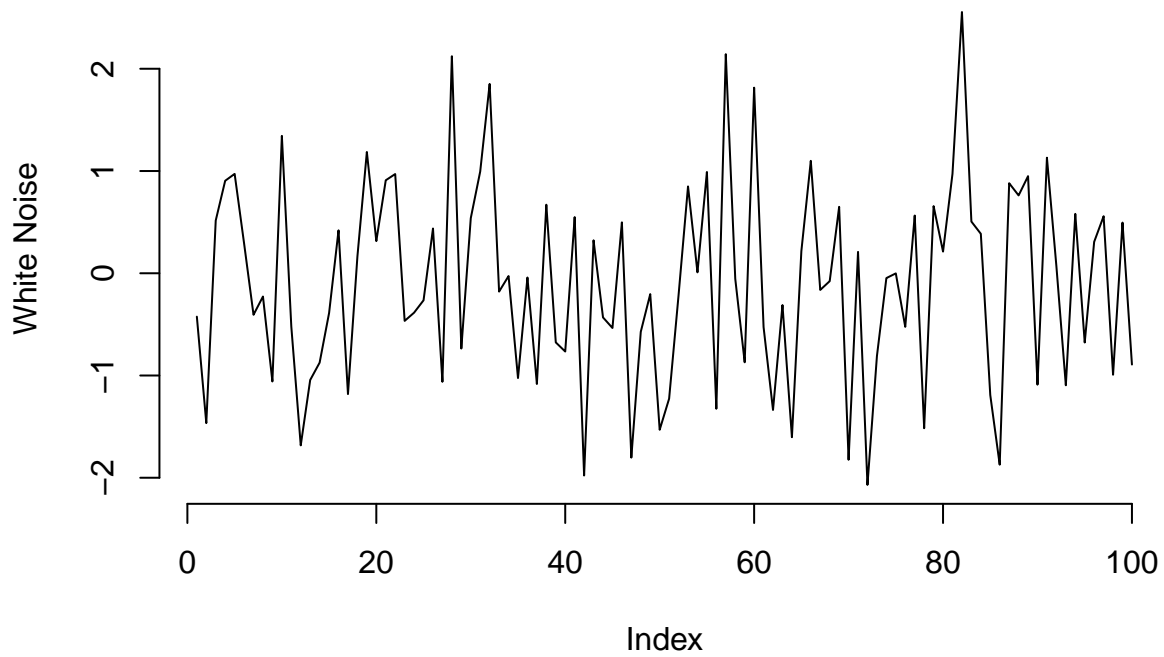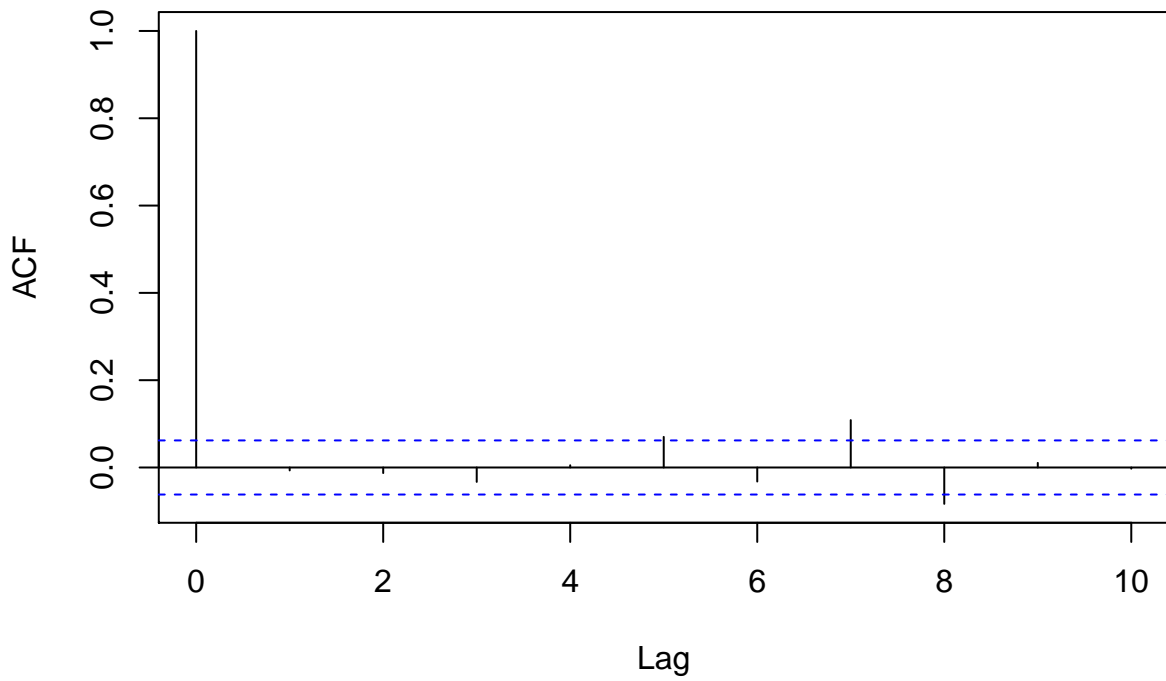
**Generating random variables for**

$$N(0, \sigma^2 \neq 1)$$

```
aa <- rnorm(10,0,2)
bb <- rnorm(50,0,2)
cc <- rnorm(100,0,2)
dd <- rnorm(1000,0,2)
```

**Estimating first 10 autocovarinace, autocorrelation and plotting the trajectories and correlogram**

```
acf(aa,10)
```

**Series aa**



```
plot(aa,type='l',ylab="White Noise",frame.plot=FALSE)
```



```
acf(bb,10)
```

**Series bb**



```
plot(bb,type='l',ylab="White Noise",frame.plot=FALSE)
```
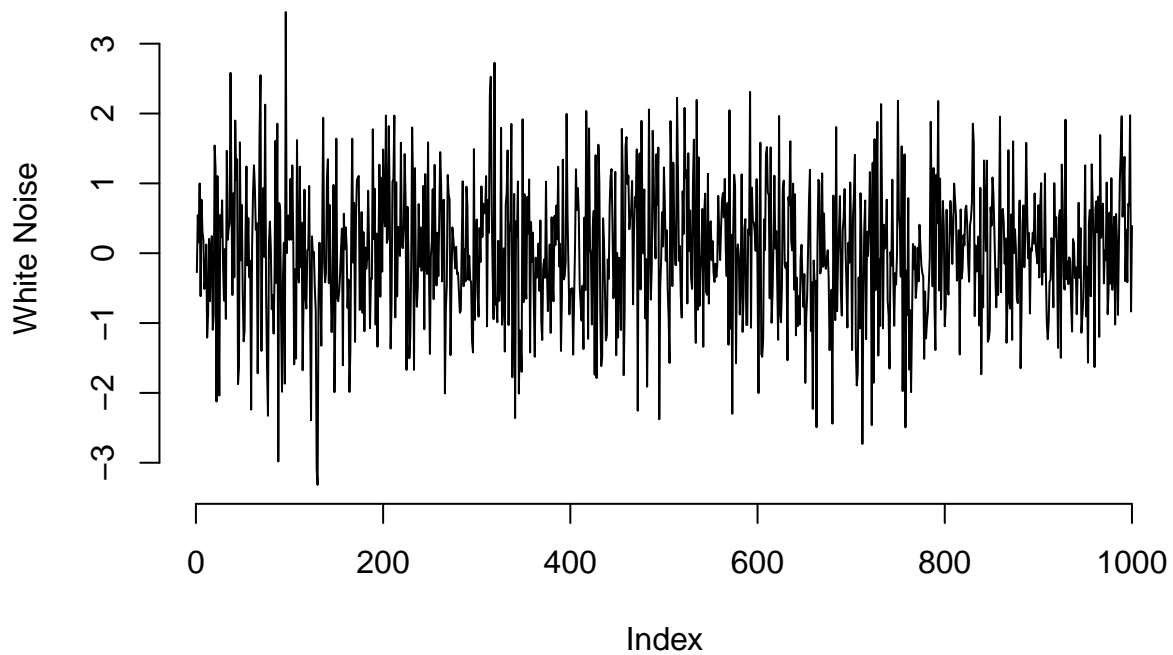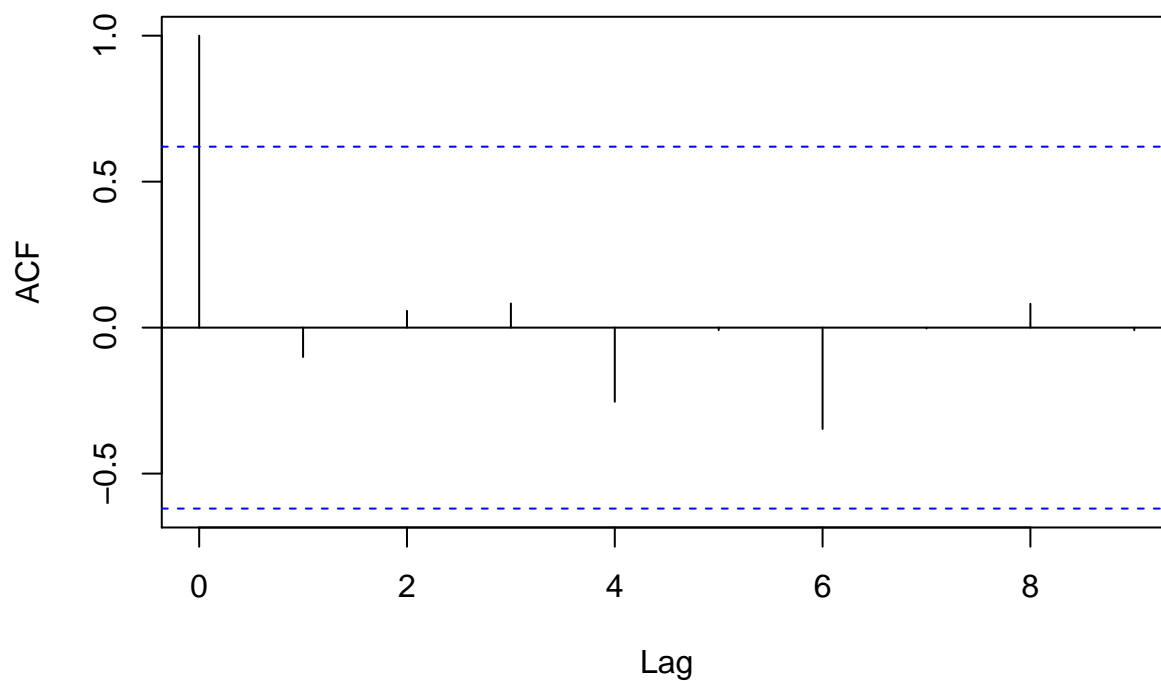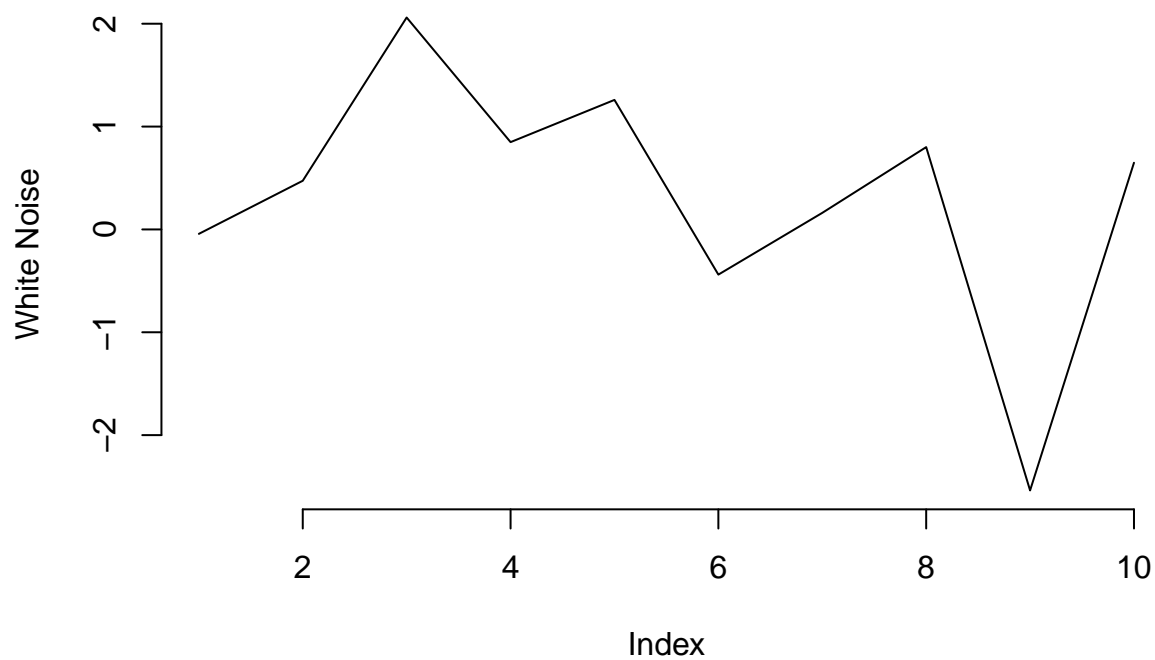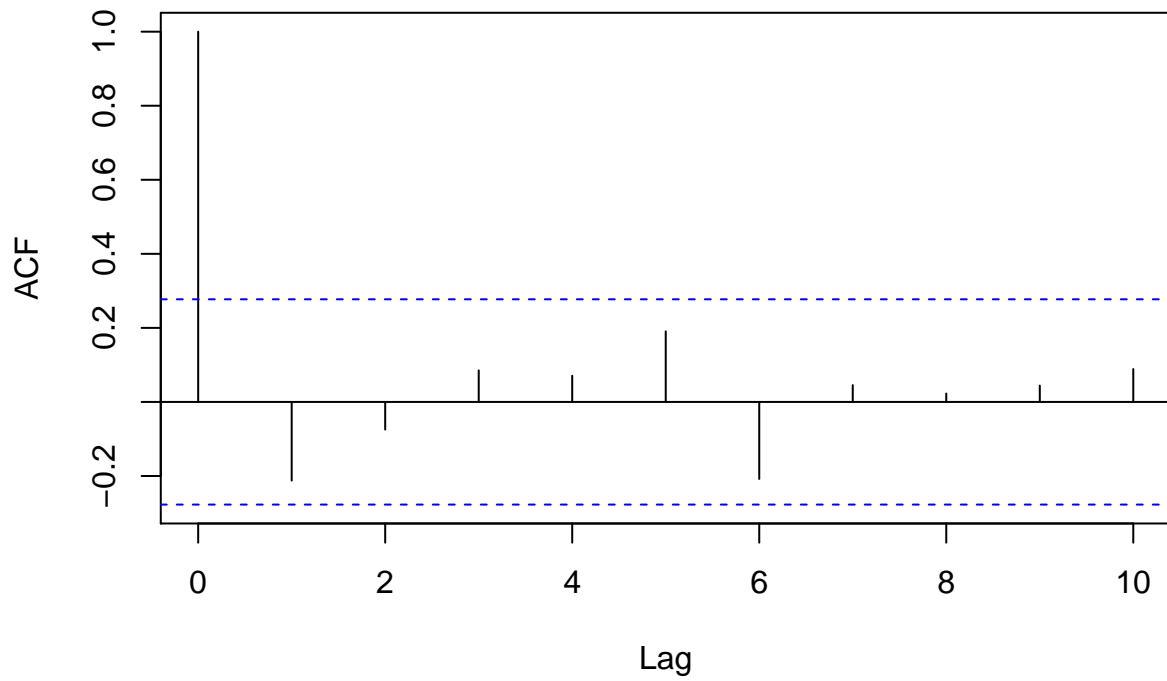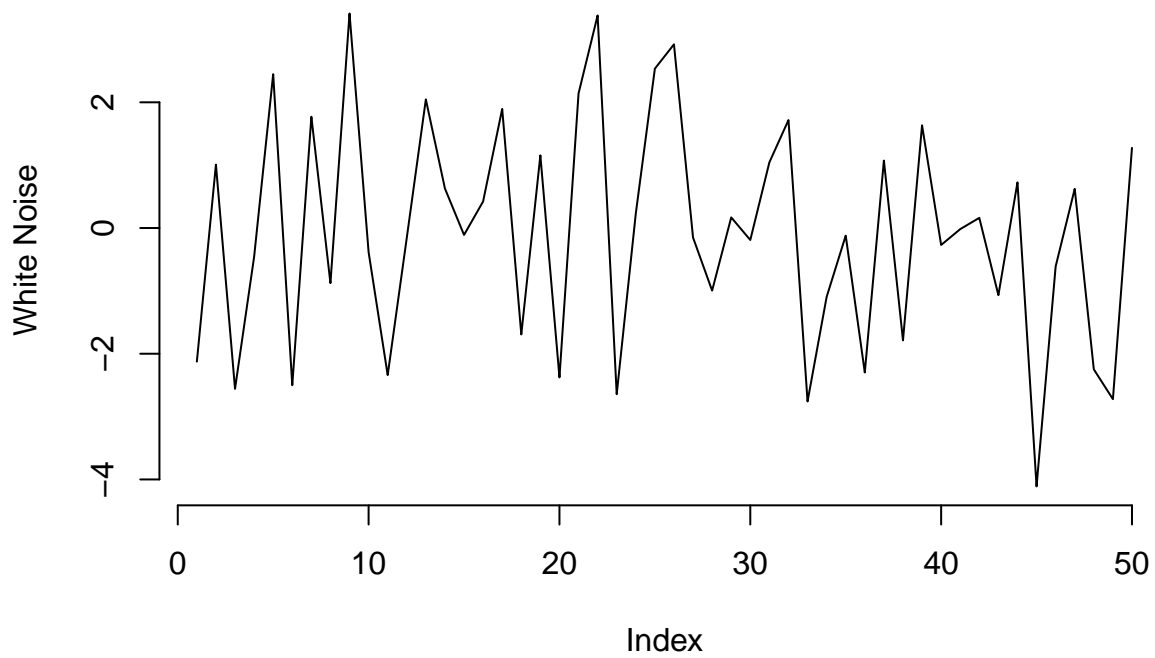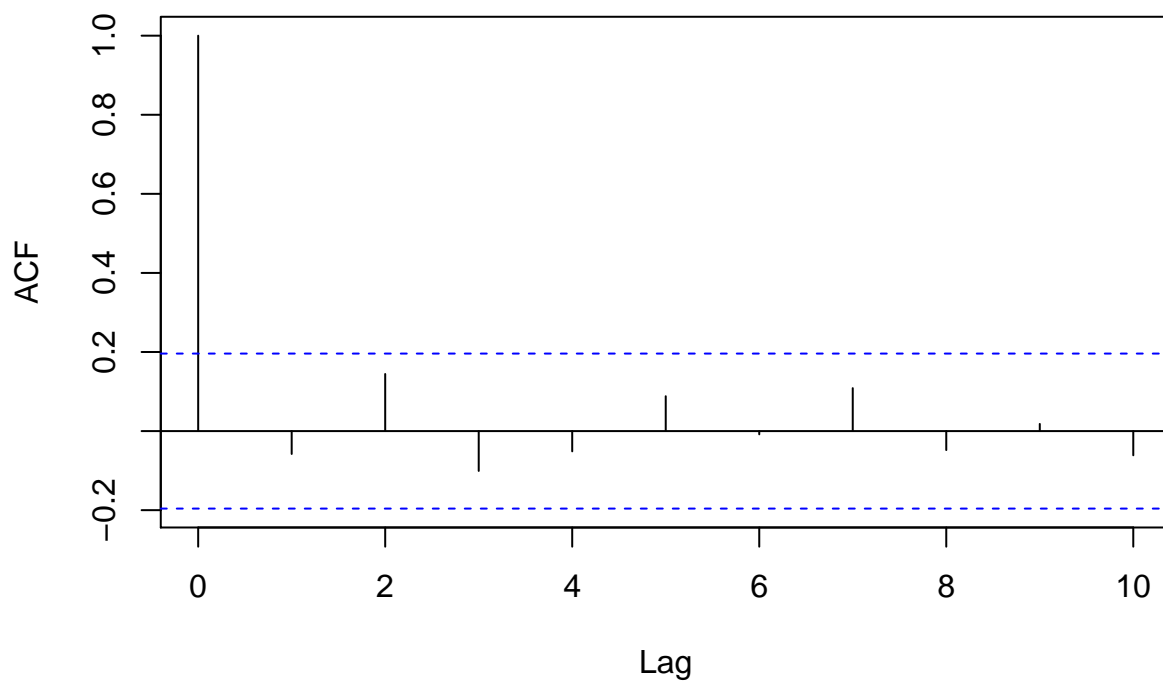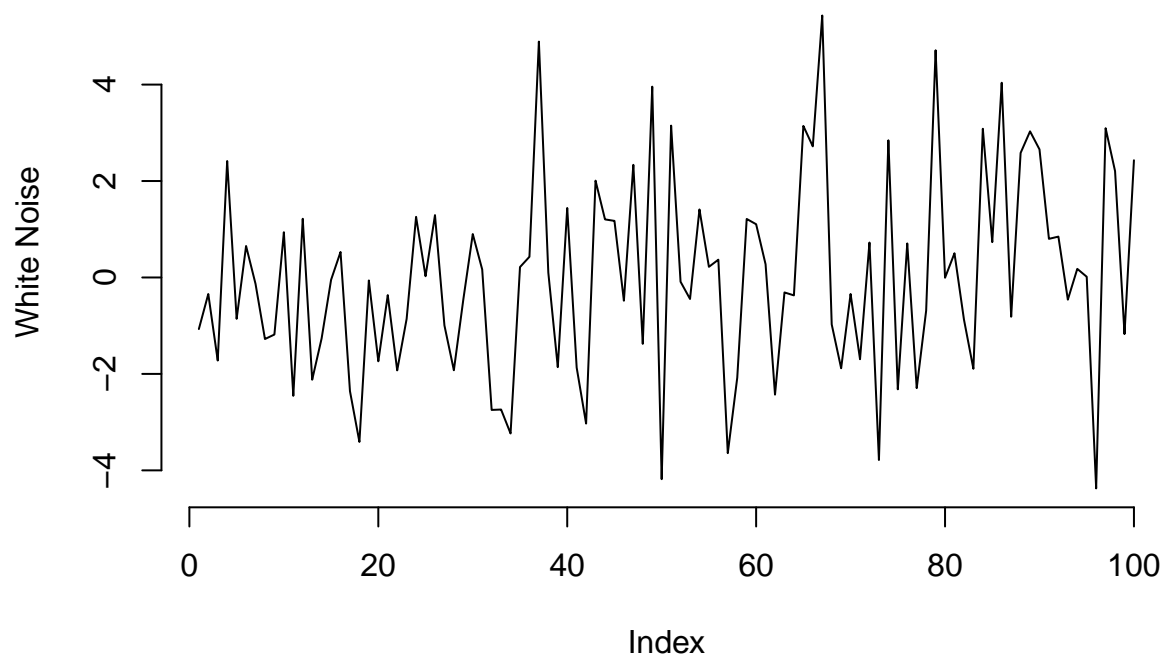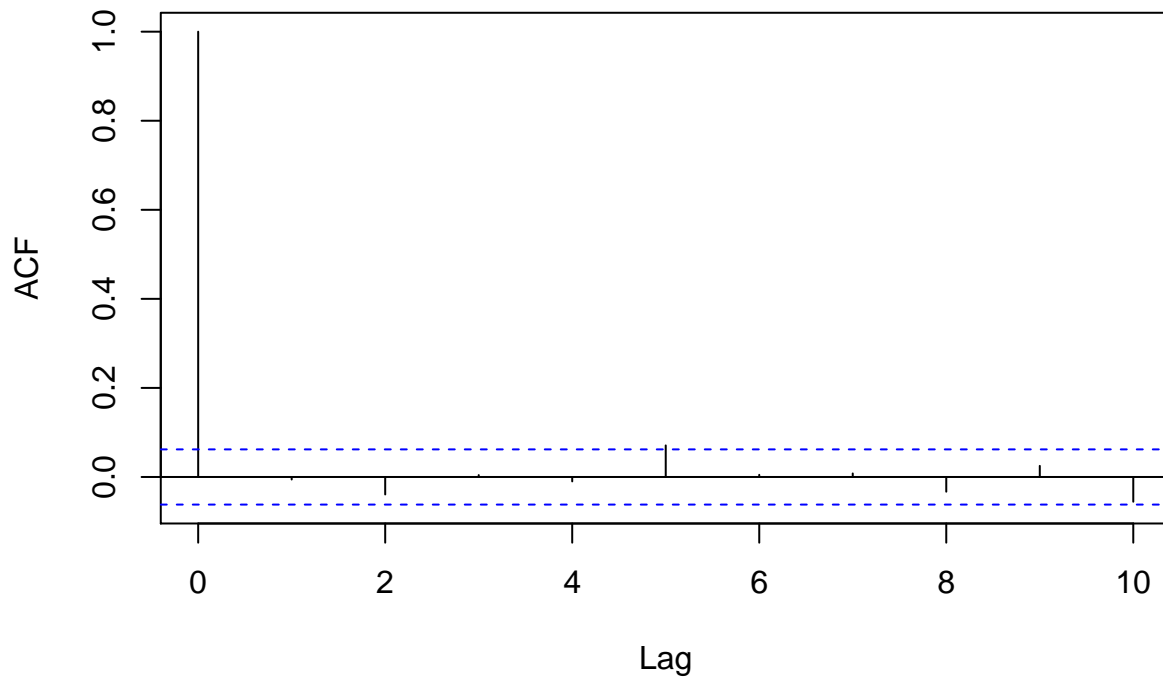


```
acf(cc,10)
```

## Series cc



```
plot(cc,type='l',ylab="White Noise",frame.plot=FALSE)
```
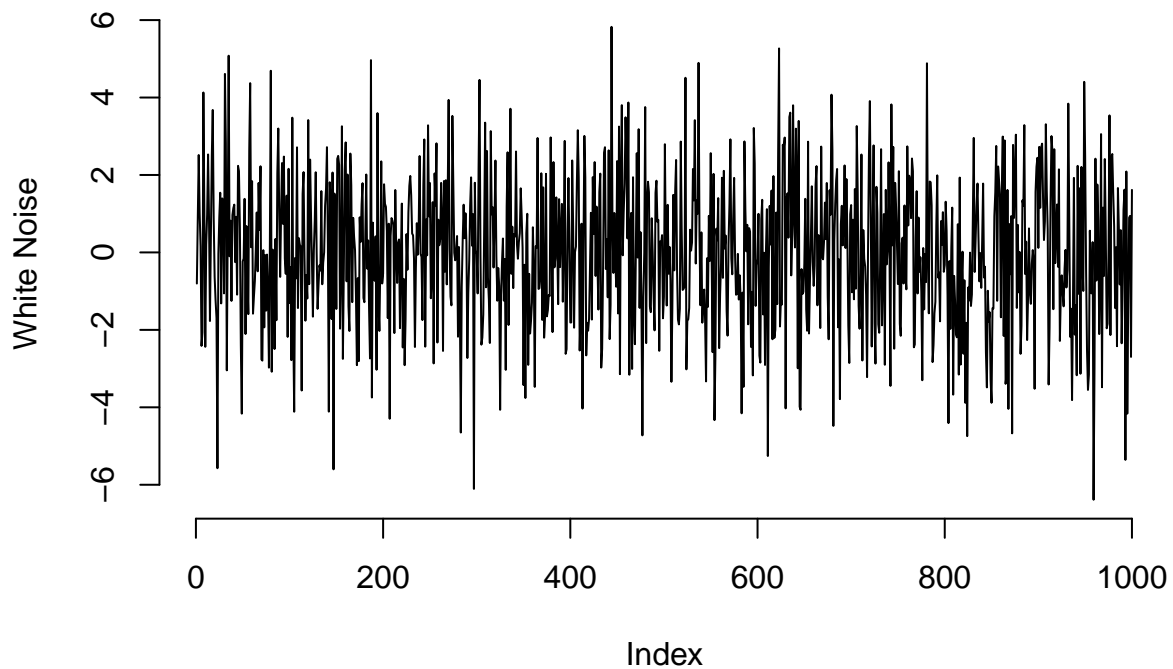


```
acf(dd,10)
```

**Series dd**



```
plot(dd,type='l',ylab="White Noise",frame.plot=FALSE)
```



It can be concluded that the significance bounds (confidence limits) becomes narrower as n increases from n = 10, 50, 100, 1000. Also Lag 0 equals 1 for all variables. Values outside the limits are considered to have significant correlation. The correlogram does not change for variance not equal to 1.