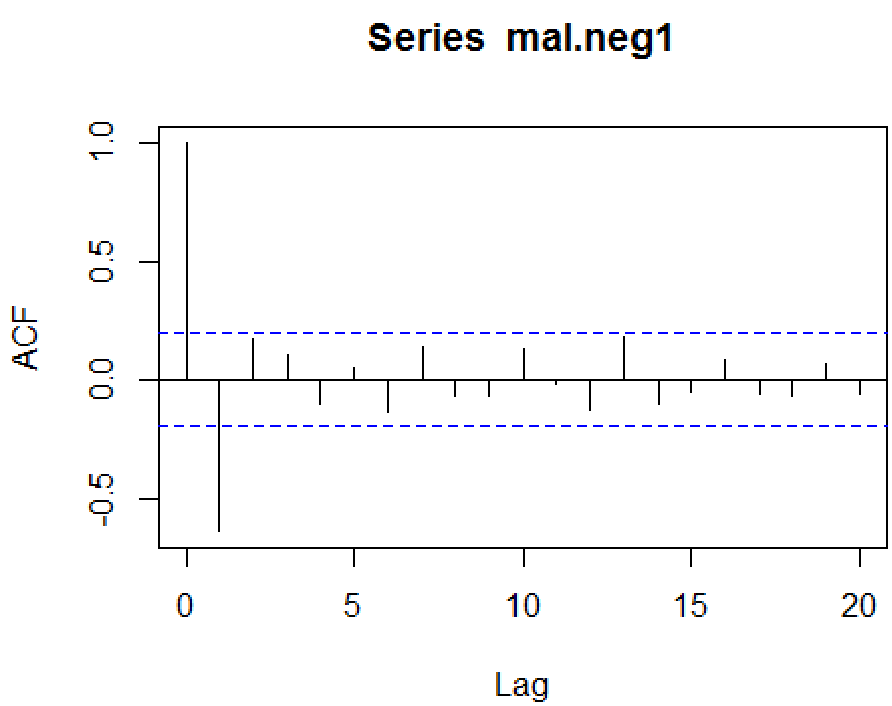
Question 1(c)

MA(2) with θ = -1

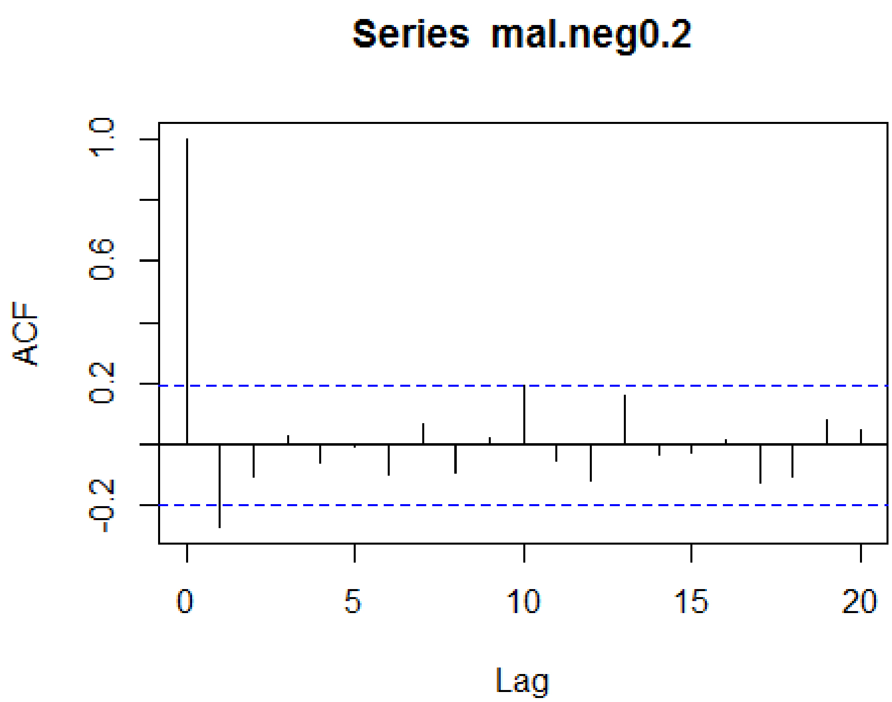
```
wn = rnorm(102,0,1) #the random values are used in all cases below

ma1.neg1 = wn[1:100] - wn[2:101] + wn[3:102]
acf(ma1.neg1)
```



comment: The autocorrelation value turns to be insignificant when h>3. There is some values of h that seems to have slightly significant autocorrelations but the overall graph does not depend on time t. Therefore, it is a stationary process.

MA(2) with θ = -0.2

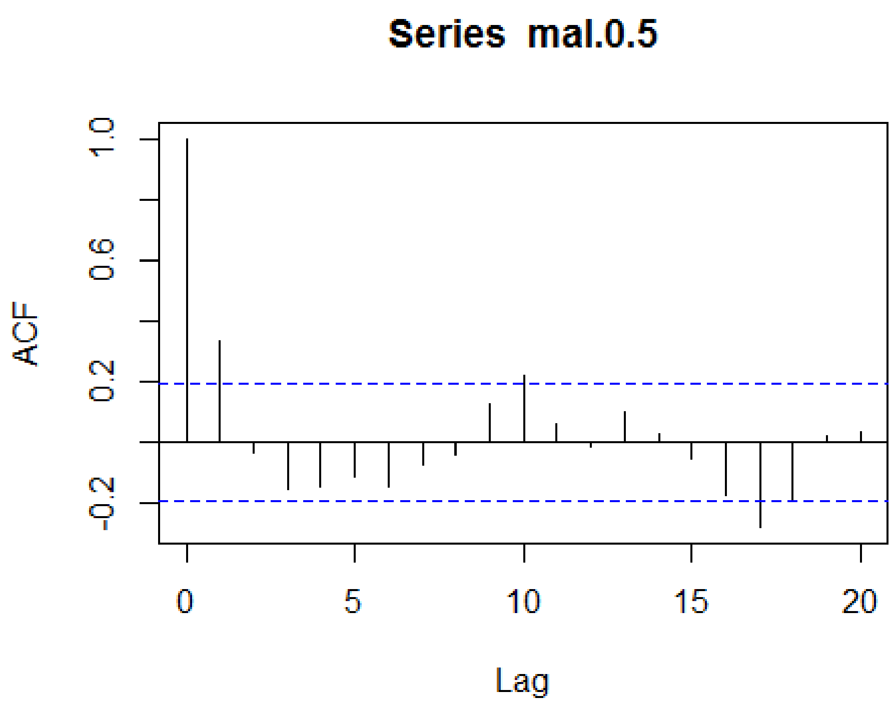
```
mal.neg0.2 = wn[1:100] - 0.2*wn[2:101] + 0.04*wn[3:102]
acf(mal.neg0.2)
```



comment: The autocorrelation value turns to be insignificant quickly as h increases. We can conclude that the autocorrelation value of mal.neg0.2 does not depend on t, thus it is a stationary process.

MA(2) with θ = 0.5

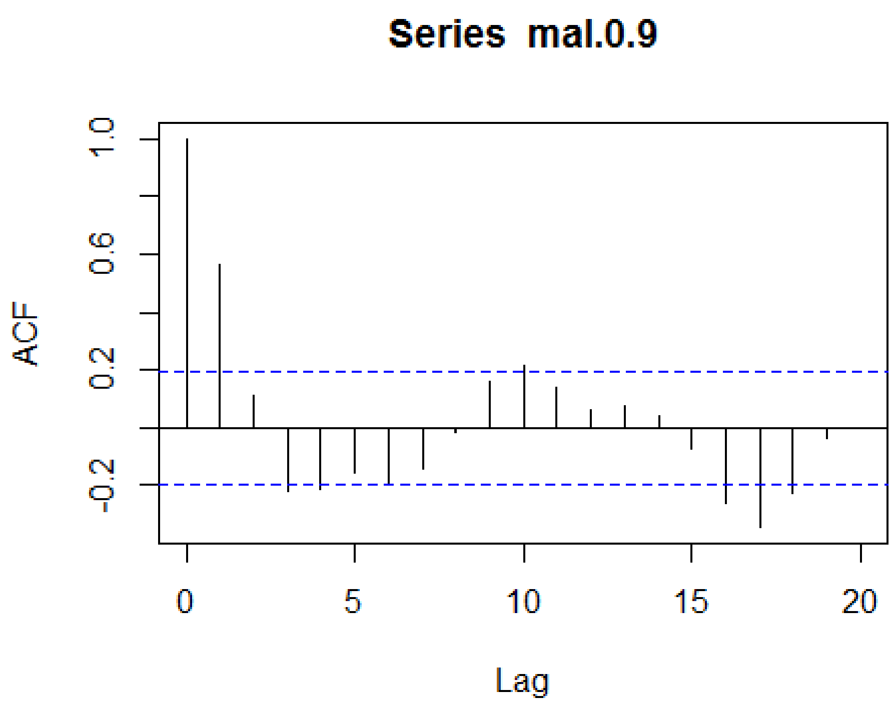
```
mal.0.5 = wn[1:100] + 0.5*wn[2:101] + 0.25*wn[3:102]
acf(mal.0.5)
```



comment: As h gets larger, ACF values get less significant. While for some h values the ACF value is slightly significant due to the uncertainty of data, the graph in general does not depend on t. Therefore, it is a stationary process.

MA(2) with θ = 0.9

```
ma1.0.9 = wn[1:100] + 0.9*wn[2:101] + 0.81*wn[3:102]
acf(ma1.0.9)
```



comment: Same as the third graph. Even though we have some ACF value a little beyond the insignificant boundary, the graph is independent of t in general. Therefore it is a sationary process.