Problem 3

3(a) Create AR(1) Function

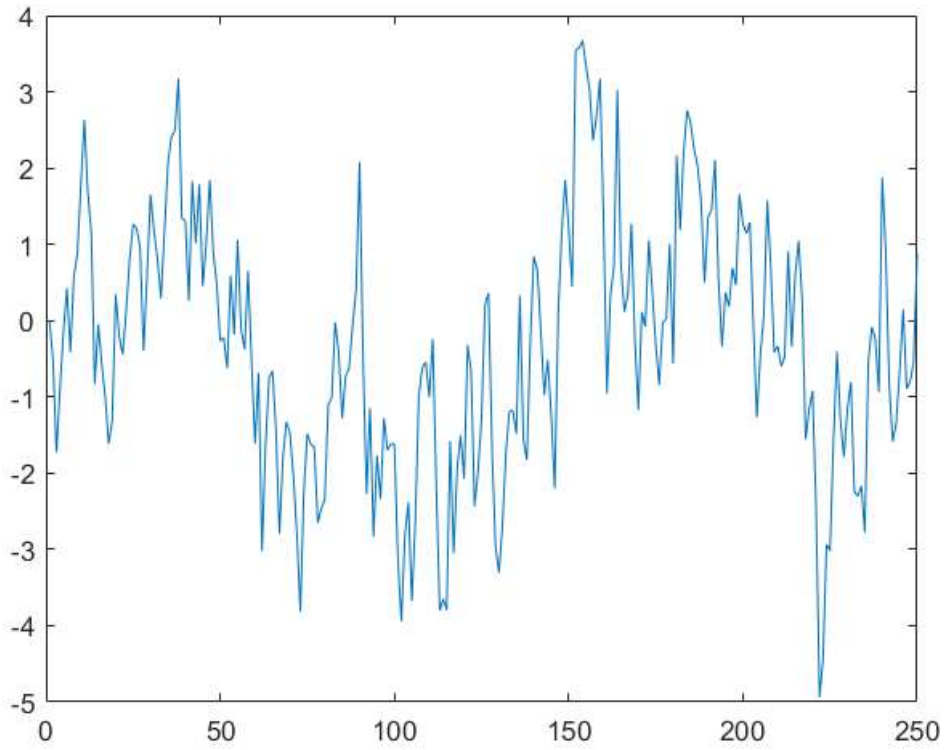
```
%function[y] = AR1( phi0, phi1, sig2eps, T, y0)
%epsilon = normrnd(0, sig2eps,1, T);   generate epsilon
%y(1) = y0                  assign y(1) = 0 (theoritical unconditional mean)
%   for t=2:T
%        y(t)=phi0+phi1*y(t-1)+epsilon(t);
%   end
%end
```

3(b) Simulate AR(1) process

```
AR = AR1(0,0.8,1,250,0)    %input given parameters
```

```
y = 0
AR = 1×250
         0   -0.4998   -1.7251   -0.9128   -0.1498    0.4255   -0.4137    0.5817    0.8676    1.77
```

```
plot(AR);
```



3(c) Comparing theoritical autocorrelations with the ones from simulation

For theoritical autocorrelation

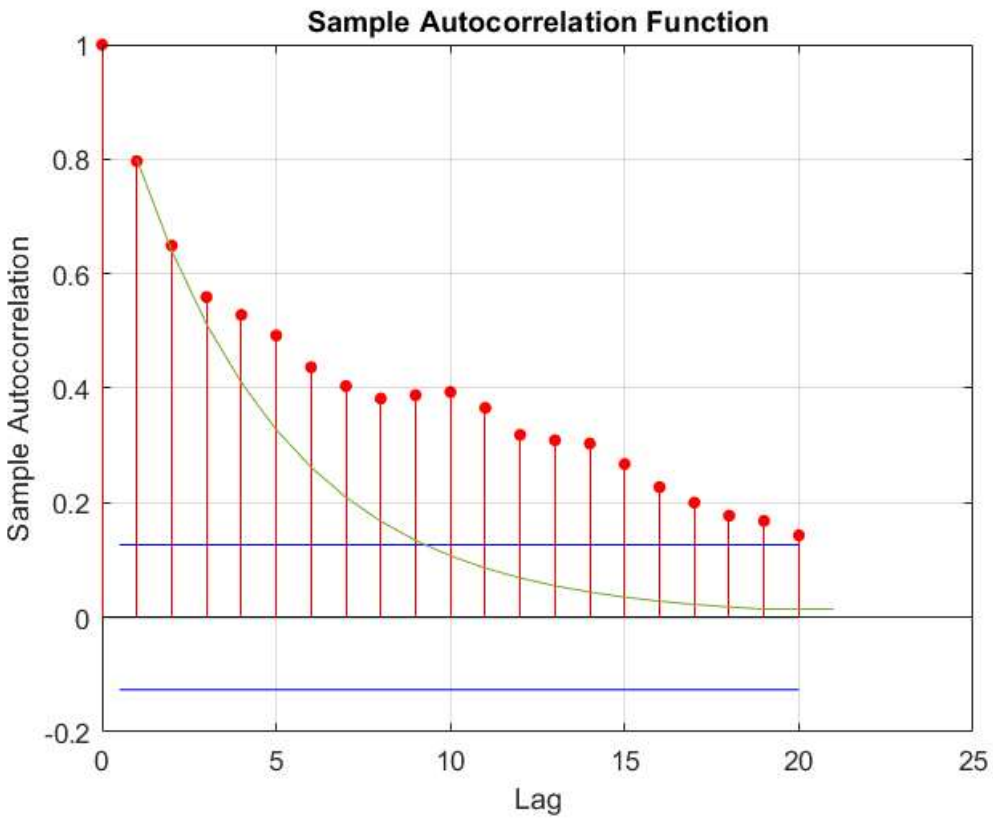
```
phi1 = 0.8
```

```
phi1 = 0.8000
```

```
for t=1:19
    ARth(t) = phi1^(t);
end
```

Plotting the two

```
autocorr(AR)
hold on
plot(ARth)
```



Note: The green line represents theoritical autocorrelations.

The red dot represents autocorrelations from simulation.