**Question #1**



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ρyy(0)** | **ρyy(1)** | **ρyy(2)** | **ρyy(3)** | **ρyy(4)** | **ρyy(5)** |
| 1 | 0.621754 | 0.221694 | -0.00258 | -0.00408 | -0.00457 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ρyy(6)** | **ρyy(7)** | **ρyy(8)** | **ρyy(9)** | **ρyy(10)** |
| -0.00506 | -0.00236 | 0.001249 | 0.004603 | 0.00523 |

**Question #2**



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ρyy(0)** | **ρyy(1)** | **ρyy(2)** | **ρyy(3)** | **ρyy(4)** | **ρyy(5)** |
| 1 | 0.666891 | 0.166948 | -0.16839 | -0.25404 | -0.17222 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ρyy(6)** | **ρyy(7)** | **ρyy(8)** | **ρyy(9)** | **ρyy(10)** |
| -0.04744 | 0.039093 | 0.064143 | 0.046818 | 0.015852 |

**Question #3**



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ρyy(0)** | **ρyy(1)** | **ρyy(2)** | **ρyy(3)** | **ρyy(4)** | **ρyy(5)** |
| 1 | 0.799214 | 0.548248 | 0.346395 | 0.207765 | 0.120184 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ρyy(6)** | **ρyy(7)** | **ρyy(8)** | **ρyy(9)** | **ρyy(10)** |
| 0.067548 | 0.038907 | 0.023929 | 0.016895 | 0.01294 |

**MatLab Code:**

%Question 1

r=randn(1,100000);

y=filter([1 .8 .4],1,r);

[ACF1 , Lags1 , bounds1] = autocorr(y);

figure

autocorr(y)

%Question 2

rho2(1) = 1;

rho2(2) = 2/3;

for i=3:1:10

rho2(i) = rho2(i-1)-.5\*rho2(i-2);

end

y2=filter(1, [1 -1 .5],r);

[ACF2 , Lags2 , bounds2] = autocorr(y2);

figure

autocorr(y2,25,0,2)

%Question 3

rho3(1) = 1/1.25;

rho3(2) = .55;

for i=3:1:10

rho3(i) = rho3(i-1)-.25\*rho3(i-2);

end

y3=filter(1, [1 -1 .25],r);

[ACF3 , Lags3 , bounds3] = autocorr(y3);

figure

autocorr(y3,25,0,2)