

trials = 100000;

X\_vector = random('Binomial', 20, 0.2, [1, trials]);

for i =1:11

count (i, 1) = i-1 ;

count (i, 2) = sum( (i-1) == X\_vector );

end

pvecX = count(:, 2)/trials;

trials = 100000;

bar ( count(:, 1), pvecX);

Y\_vector = random('geo', .1, [1, trials]);

for i =1:11

count (i, 1) = i-1 ;

count (i, 2) = sum( (i-1) == Y\_vector );

end

pvecY = count(:, 2)/trials;

bar ( count(:, 1), pvecY);

trials = 10000000;



Z\_vector = random('poiss', .3, [1, trials]);

for i =1:11

count (i, 1) = i-1 ;

count (i, 2) = sum( (i-1) == Z\_vector );

end

pvecZ = count(:, 2)/trials;

bar ( count(:, 1), pvecZ);

The simulation of the PMF of Y=(X1-1)^2 compares well with the probability mass function you computed analytically, because the only possible values are 0 for (X=1), 1 for (X=0 and 2), 4 for (X=3) and 9 for (X=4)

**PMF of X1**

**PMF of Y**