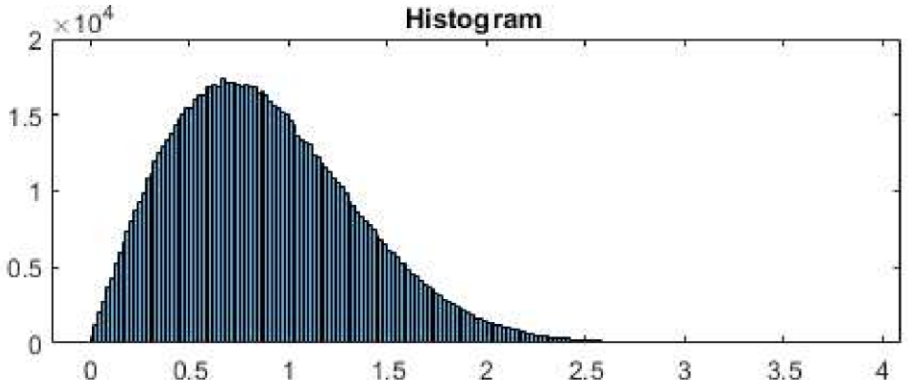
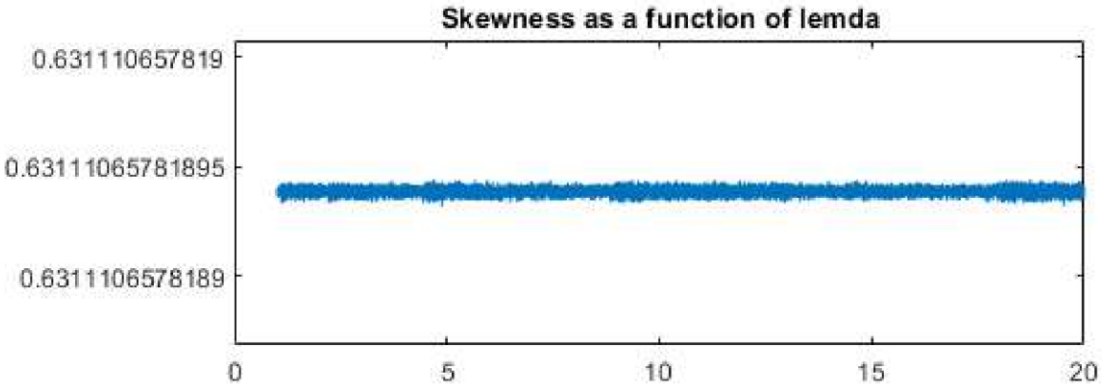
```
% Q #1 :

    Lemda=1;                          %scale parameter
    K=2;                              %shape paramater
    m0=1;                             %1 row
    n0=1000000;                       %1 million columns
    X=wblrnd(Lemda,K,m0,n0) ;         %1 million sample of random variable"weibull distripution
"

    subplot(2,1,1); y= histogram(X);      % plot the histogram of the weibull distripution
    title('Histogram ')

% Q #2 :
    fprintf('ORDER\t\tMoment CODE value\t\tMoment EXACT value\n')

 for n=1:1:5                         %for loop to calculate the moment 5 times ,order= 1 to 5

    m(n)=mean(X.^n);
    a(n)=1+n/K ;
    gamma_function(n)=gamma(a(n));
    %then
    mom(n)=(Lemda.^n).*gamma_function(n) ;

    fprintf('%0.1f\t\t\t%f\t\t\t\t%f\n',n,m(n),mom(n));

 end

% Q : 3 :
    fprintf('\n')
    fprintf('Variance code value\t\tVariance EXACT value\n')

    var_code=var(X);
    var_exact=Lemda.^2.*(gamma_function(2)-gamma_function(1).^2);

    fprintf('%f\t\t\t\t\t%f\n',var_code, var_exact);



% Q : 4 :
     fprintf('\n')
     skewness_code=skewness(X);
     disp("skewness_code at lemda=1 = ");
     disp(skewness_code);

   %plot skewness

    Lemda=1:0.001:20;                        %new domain for lemda =1,..,20
```

```
%define 1st moment and variance as a function of lemda

 m1=Lemda.*gamma_function(1);
 variance=Lemda.^2.*(gamma_function(2)-gamma_function(1)^2);
 V=variance.^(1/2);
 skewness_function= ((gamma_function(3).*Lemda.^3)-(3.*m1.*variance)-m1.^3)./((V).^3);

 subplot(2,1,2)
 plot(Lemda,skewness_function)
 title('Skewness as a function of lemda')
```

```
ORDER           Moment CODE value               Moment EXACT value
1.0                      0.885775                                0.886227
2.0                      0.999040                                1.000000
3.0                      1.327464                                1.329340
4.0                      1.996551                                2.000000
5.0                      3.317669                                3.323351

Variance code value             Variance EXACT value
0.214443                                        0.214602

skewness_code at lemda=1 =
   0.630816970162100
```





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