```
clc; clear all; close all;
filename='temperature_global.xlsx';
data = xlsread(filename);                    % reads the data from excel
data(:,1)=[];                                % remove year

   xbar=mean(data);                          % mean of columns of experimental samples
   sigma=std(data);                          % standard deviation of columns of experimental s
amples
   [m,n]=size(data);                         % get size of  experimental samples
   NormA=data-(ones(m,1)*xbar);              % mean shift
   NormA=NormA./(ones(m,1)*sigma);           % scale by standard deviation
   X=NormA(:,[1:n-1]);                       % extract input experimental data
   Y=NormA(:,n);                             % extract output experimental data
   alpha_O=inv(X.'*X)*X.'*Y;                 % OLS slope estimate
   beta=mean(Y)-alpha_O.'*mean(X).';         % OLS constant estimate

   Z=[X Y];
   S=Z.'*Z;                                  % Covariance matrix
   [V,D]=eig(S);                             % V - eigen vector matrix, D- eigen values
   alpha_T=-V(:,1)/V(n,1)  ;                 % TLS estimates
   alpha_T(n)=[];                            % Remove the output vector

   fprintf('\n\n-------------------------------------------------------\n')
   fprintf('\n The OLS and TLS estimates respectively are, \n')
     alpha= [alpha_O alpha_T]
   fprintf('\n-------------------------------------------------------\n')
```

```
-------------------------------------------------------

 The OLS and TLS estimates respectively are,

alpha =

    3.2827   21.0566
    0.9375    3.4639
   -3.2725  -23.4535
    0.0639   -0.1338


-------------------------------------------------------
```

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