% fit_eta_prime.m
%
% This MATLAB program uses a simple least square
% method to fit a linear model to dynamic viscosity
% data.
%
% K. Beers
% MIT ChE
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```
function iflag_main = fit_eta_prime(lambda);


iflag_main = 0;


% First, read in the data from the input files.
load frequency.dat;
load eta_prime.dat;
num_data = length(frequency);
if(num_data ~= length(eta_prime))
   iflag_main = -1;
   error('fit_eta_prime: mismatch of input data dimensions');
end

% Next, make a plot of the data.
semilogx(frequency,eta_prime,'o');
xlabel('frequency');
ylabel('eta prime');
title('Dynamic viscosity');


% Then, generate the design matrix.
num_lambda = length(lambda);
X = zeros(num_data,num_lambda);
for j=1:num_lambda
   X(:,j) = lambda(j)./(1.+(frequency.*lambda(j).^2));
end

% set the alpha value for the confidence interval and
% the plotting option.
alpha = 0.05;
iplot = 2;
plot_type = 1;
plot_text.xlabel = 'Frequency (Hz)';
plot_text.ylabel = 'eta prime';
plot_text.title = 'Fit of dynamic viscosity data';
```

% call the multiple regression solver.

```
addpath('~/MATLAB_files');
[b,bint,r,rint,stats,sample_var,iflag] = ...
        simple_LS(eta_prime,X,alpha, ...
        iplot,plot_type,frequency,plot_text);

iflag_main = 1;
return;
```