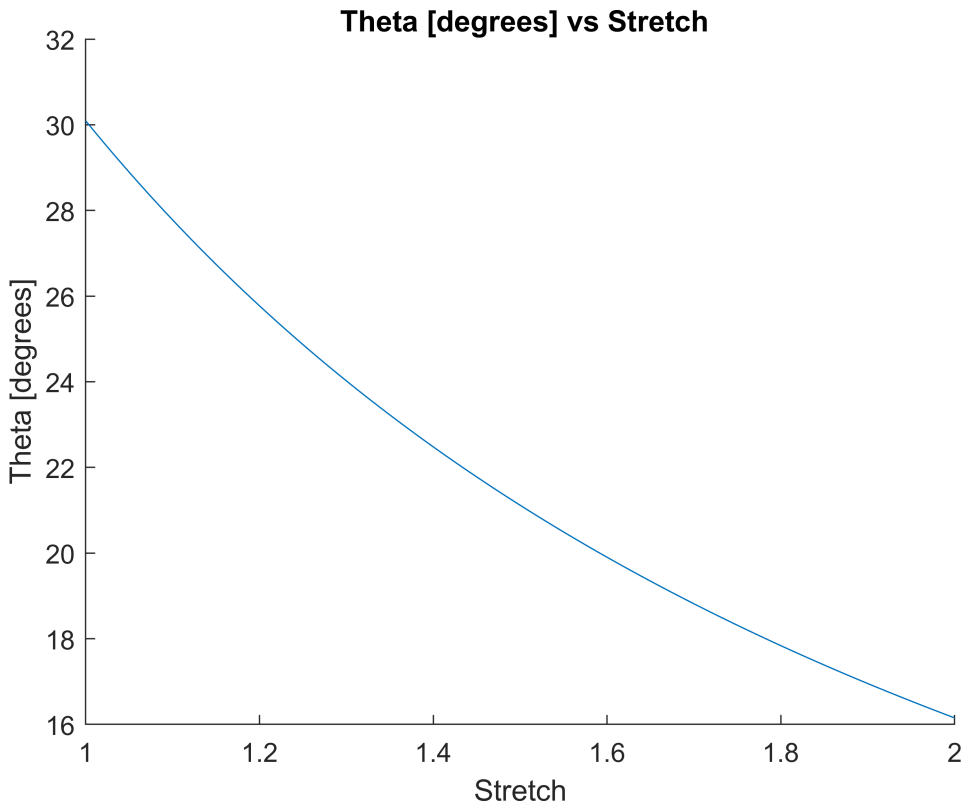
1d V

```
figure
hold on
x = [1:0.01:2];
theta = acos( (sqrt(3) .* x) ./ (sqrt(3 .* (x.^2) +1 )));
theta = theta / 0.0174;

plot(x, theta);
xlabel('Stretch')
ylabel('Theta [degrees]')
title(' Theta [degrees] vs Stretch')
```



Problem 2 A &B

```
data = readmatrix('Default Dataset (1)');

time=data(:,1);
stress=data(1:6,2);
stress = -stress ;
stretch = (1: -.1: .5);
stretch = stretch';
%stretch = stretch+1; % conversion from engineering strain
```

```
figure
hold on
scatter(stretch,stress,'Marker','o')
xlabel('Stretch')
ylabel( 'Compressive stress [MPa]')

F = @(x,stretch)( (x(1).*stretch) - ( (2.*x(1)) - x(2).*log(stretch.^2)).(2.*stretch) )
```

```
F = function_handle with value:
    @(x,stretch)((x(1).*stretch)-((2.*x(1))-x(2).*log(stretch.^2))./(2.*stretch))
```

```
x = lsqcurvefit(F,[1 1],stretch,stress)
```

```
Local minimum found.

Optimization completed because the size of the gradient is less than
the value of the optimality tolerance.

<stopping criteria details>
x = 1×2
    0.0755    0.1174
```

```
plot(stretch,F (x, stretch),'r','Linewidth', 1)


FC = @(y, strain) (.5*(y(1) * ((strain.^2 -1) ./ (strain.^2*(y(2) + 1))) .*exp(y(2) *(strain.^2
```

```
FC = function_handle with value:
    @(y,strain)(.5*(y(1)*((strain.^2-1)./(strain.^2*(y(2)+1))).*exp(y(2)*(strain.^2-1))))
```

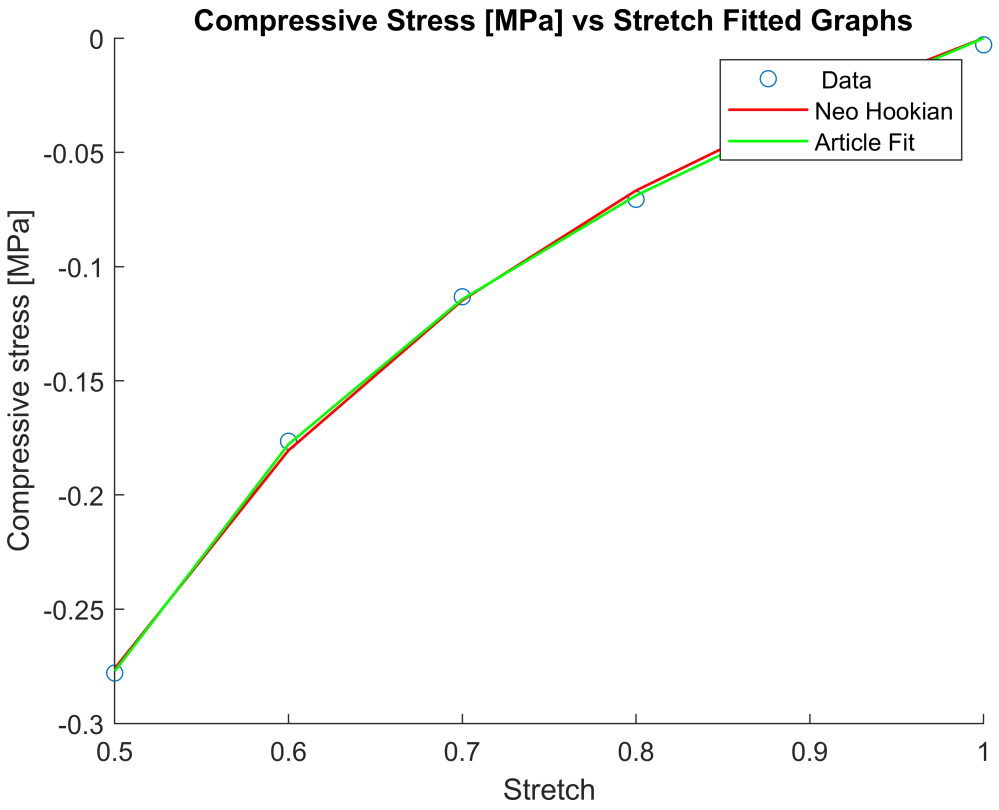
```
y = lsqcurvefit(FC,[1 1],stretch,stress)
```

```
Local minimum found.

Optimization completed because the size of the gradient is less than
the value of the optimality tolerance.

<stopping criteria details>
y = 1×2
    0.5474    0.7229
```

```
plot(stretch,FC (y, stretch),'g','Linewidth', 1)
legend(' Data', 'Neo Hookian', 'Article Fit');
title( ' Compressive Stress [MPa] vs Stretch Fitted Graphs')
```



2c

```
%2c)

% The article constant values are Hao: 0.40 +- 0.14 Mpa and B: 0.35 +-0.29
% The y(1) and y(2) ( 0.54, 0.7229) values I found are somewhat similiar!!
```

2d

```
% Permeability s
```