ME 1020 Engineering Programming with MATLAB

Problem 2.18:

18. The potential energy stored in a spring is $kx^2/2$, where k is the spring constant and x is the compression in the spring. The force required to compress the spring is kx. The following table gives the data for five springs:

	Spring				
	1	2	3	4	5
Force (N)	11	7	8	10	9
Spring constant k (N/m)	1000	600	900	1300	700

Use MATLAB to find (*a*) the compression x in each spring and (*b*) the potential energy stored in each spring.

```
% Problem 2.18
clear
clc
disp('Problem 2.18: Scott Thomas')
disp('Force:')

f = [11 7 8 10 9]
disp('Spring Constant:')
k = [1000 600 900 1300 700]

% Part (a)
disp('Part (a): find compression x in each spring')

x = f./k

% Part (b)
disp('Part (b): potential energy stored in each spring')

pe = (k.*x.^2)/2
```

```
Problem 2.18: Scott Thomas
Force:

f =

    11     7     8    10     9

Spring Constant:

k =

        1000         600         900        1300         700

Part (a): find compression x in each spring

x =
```

```
    0.0110    0.0117    0.0089    0.0077    0.0129

Part (b): potential energy stored in each spring

pe =

    0.0605    0.0408    0.0356    0.0385    0.0579
```