Exercises for Day 8

Exercise 1. Use a "Method 1" form script to create 3 different vectors using a single `for` loop:

1. a vector of x values starting at 0 and ending 4 with an increment of 0.2;
2. a vector containing the value of y at each x for the function $y(x) = x^3 - 2x^2$;
3. a vector containing the slope of $y(x)$ at each x value: $\frac{\mathrm{d}y(x)}{\mathrm{d}x} = 3x^2 - 4x$.

Within the loop, print the components of the vectors to a text file, one line at a time. Your table should begin as follows:

```
    x          y(x)        dy(x)/dx
-------    ----------    ----------
  0.0          0.000         0.000
  0.2         -0.072        -0.680
  0.4         -0.256        -1.120
  0.6         -0.504        -1.320
```

Exercise 2. Modify your code in Exercise 1 to solve the same problem using "Method 2". Only turn in the code from your script. (Your output text file should be identical to that for Exercise 1.)

Exercise 3. Consider the vertical flight of a projectile, which you examined in Day 2 Exercise 3. The altitude of the projectile is given by

$$y = v_0 t - \frac{1}{2} g t^2$$

For this Exercise, use $v_0 = 100$ m/s and $g = 9.81$ m/s^2. Use a "Method 1" form script to create 2 different vectors using a single `for` loop:

1. a vector of time, t, values from 0 to 2 seconds in increments of 0.1 seconds;
2. a vector of altitude, y, values for each of those times.

Within the loop, print the components of the vectors to a text file, one line at a time. Your table should begin as follows:

```
Time(s)     Altitude(m)
 0.0            0.0
 0.1           10.0
 0.2           19.8
 0.3           29.6
```

Exercise 4. Modify your code in Exercise 3 to solve the same problem using "Method 2". Only turn in the code from your script. (Your output text file should be identical to that for Exercise 3.)