Name: Josh Stafford
Assignment: Lab 7 Part 1
Section: ENGR 102 - 206
An aggie does not lie, cheat, or steal, nor tolerate those who do.
The model will consist of 4 line segments:

1. 0 to A/B
2. A/B to C
3. C to D
4. D to E.

Coordinates (approximations):

0 – (0, 0)

A/B – (0.0125, 44)

C – (0.06, 44)

D – (0.18, 60)

E – (0.2625, 52)

Young's Modulus (approximately): 3520

Variables:

1. slopeOne = 3520
2. slopeThree = 16 / 0.12
3. slopeFour = - 8 / 0.0825
4. inputStrain = float(input("Please enter a strain point (0 – 0.2625):"))
5. outputStress = <some computation to be planned>

Steps:

1. Establish starting slope values as variables
2. Ask the user to input a value of strain for which they would like to find stress.
3. Evaluate conditionals:
    a. If the strain is past or below the boundaries, print an error statement and ends program
    b. If the strain is on the 4th segment, use the 4th slope to interpolate
    c. If the strain is on the 3rd segment, use the 3rd slope to interpolate
    d. If the strain is on the 2nd segment, use the 2nd slope to interpolate
    e. If the strain is on the 1st segment, use the 1st slope to interpolate

    (note): if the conditionals are in this order, you can just use > operator because if it does not meet the earlier conditions, you don't have to worry about upper bounds of comparison

4. Compute stress based off the conditionals:
    a. If inputStrain > 0.2625 or inputStrain < 0:
        i. Print("That is not a valid strain value")
    b. elif inputStrain > 0.18:
        i. outputStress = slopeFour * (inputStrain – 0.18) + 60
    c. elif inputStrain > 0.06:

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i. outputStress = slopeThree * (inputStrain – 0.06) + 44

d. elif inputStrain > 0.0125:
    i. outputStress = 44
e. else:
    i. outputStress = slopeOne * inputStrain

5. Print the value of stress
    a. Print("The stress at a strain of", inputStrain, "is", outputStress)

Test Cases:

Strain	Stress	Case	Region
0	0	Edge	1
0.0075	26.4	Typical	1
0.0125	44	Edge	1
0.042	44	Typical	2
0.06	44	Edge	2
0.126	52.8	Typical	3
0.18	60	Edge	3
0.235	54.6667	Typical	4
0.2625	52	Edge	4