By submitting this assignment, I agree to the following:
"Aggies do not lie, cheat, or steal, or tolerate those who do."
"I have not given or received any unauthorized aid on this assignment."
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Assignment: Lab5b Act 1
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Value of Young's Modulus

The value of Young's modulus for this graph is 4300 ksi. This was found by finding the slope of the OA segment.

Variable List

A = [.01, 43]
C = [.06, 43.5]
D = [.18, 60]
E = [.27, 51]
OA = 4300
AC = 10
CD = 137.5
DE = -100
Strain = float(input())

Sequence of Steps

1. The user needs to input a float value for strain
2. If the value is greater than 0 and less than or equal to .01, then the strain will be placed in the OA interpolation equation.
    - Y = 43 + (input - .01)*(43 - 0/ .01 - 0)

   If the value is greater than .01 and less than or equal to .06, then the strain will be placed in the AC equation.
    - Y = 43.5 + (input - .06)*(43.5 - 43/ .06 - .01)

   If the value is greater than .06 and less than or equal to .18 , then the strain will be placed in the CD equation.
    - Y = 60 + (input - .18)*(60 - 43.5/ .18 - .06)

   If the value is greater than .18 and less than or equal to .27, then the strain will be placed in the DE equation.

- Y = 51 + (input - .27)*(51-60/ .27 - .18)

(All of these equations are derived from setting the slope between the 2 segments equal to the slope of the larger point and the input strain and solving for unknown stress.)

3. Print out the now known stress value.

Test Cases

1. Input: Strain = .005
   Output: Stress = 21.5 ksi
   Typical case

2. Input: Strain = .01
   Output: Stress = 43 ksi
   Edge case

3. Input: Strain = 0.0
   Output: Stress = 0.0 ksi
   Edge case

4. Input: Strain = .05
   Output: Stress = 43.4 ksi
   Typical case

5. Input: Strain = .06
   Output: Stress = 43.5 ksi
   Edge case

6. Input: Strain = .1
   Output: Stress = 49 ksi
   Typical case

7. Input: Strain = .18
   Output: Stress = 60 ksi
   Edge case

8. Input: Strain = .20
   Output: Stress = 58 ksi
   Typical case

9. Input: Strain = .25
   Output: Stress = 53 ksi
   Typical case

10. Input: Strain = .27
    Output: Stress = 51 ksi
    Edge case