ASSIGNMENT : 11

Application of Python in the field of design of uniaxial column

import math

Input parameters

length = float(input("Enter the length of the column (in meters): ")) diameter = float(input("Enter the diameter of the column (in meters): ")) applied_force = float(input("Enter the applied axial force (in Newtons): "))

material_yield_strength = float(input("Enter the yield strength of the material (in Pascals): "))

Calculate the column's cross-sectional area cross_sectional_area = (math.pi / 4) * (diameter ** 2)

Calculate critical load using Euler's formula

critical_load = (math.pi ** 2) * material_yield_strength * (diameter ** 2)

/ (4 * (length ** 2))

Determine if the column is safe or will buckle if applied_force <= critical_load:

print("The column is safe. Applied load is below the critical load.") else:

print("The column is not safe. Applied load exceeds the critical load.")

Enter the length of the column (in meters): 3.6 Enter the diameter of the column (in meters): 0.9 Enter the applied axial force (in Newtons): 940000

Enter the yield strength of the material (in Pascals): 250000000 The column is safe. Applied load is below the critical load.