

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.
```