ASSIGNMENT 6

Q1

```
# Stress when depth is constant
Q = float(input("Enter the value of Load in kN: "))
N = int(input("Number of data values of radial distance: "))
pi = 3.14159265359
Z = float(input("Depth (m): "))
for i in range(1, N + 1):
    Value_r = float(input(f"Enter radial distance {i} in m: "))
    Stress = ((3 * Q) / (2 * pi * Z * Z)) * ((1 / (1 + ((Value_r / Z) ** 2))) ** 2.5)
    print("Stress:", Stress, "kN/m^2")
```

OUTPUT-

```
Enter the value of Load in kN: 2500
Number of data values of radial distance: 5
Depth (m): 6
Enter radial distance 1 in m: 1
Stress: 30.962130445358056 kN/m^2
Enter radial distance 2 in m: 2
Stress: 25.479163627894877 kN/m^2
Enter radial distance 3 in m: 3
Stress: 18.98033449112347 kN/m^2
Enter radial distance 4 in m: 4
Stress: 13.22290223969301 kN/m^2
Enter radial distance 5 in m: 5
Stress: 8.871775810212231 kN/m^2
```

Q2

```
# Stress when radius is constant
Q = float(input("\nEnter the value of Load in kN: "))
M = int(input("Number of data values of depth: "))
pi = 3.14159265359
r = float(input("Radial Distance (m): "))
for j in range(1, M + 1):
    Value_Z = float(input(f"Enter depth {j} in m: "))
    Stress = ((3 * Q) / (2 * pi * Value_Z * Value_Z)) * ((1 / (1 + ((r / Value_Z) ** 2))) ** 2.5)
    print("Stress:", Stress, "kN/m^2")
```

OUTPUT-

```
Enter the value of Load in kN: 2500
Number of data values of depth: 6
Radial Distance (m): 5
Enter depth 1 in m: 1
Stress: 0.34629643854273023 kN/m^2
Enter depth 2 in m: 2
Stress: 2.1085135063018074 kN/m^2
Enter depth 3 in m: 3
Stress: 4.781320614736756 kN/m^2
Enter depth 4 in m: 4
Stress: 7.0974399578803125 kN/m^2
Enter depth 5 in m: 5
Stress: 8.440465463972316 kN/m^2
Enter depth 6 in m: 6
Stress: 8.871775810212231 kN/m^2
```

Q2

```
# Single calculation using Boussinesq's equation
Q = float(input("\nEnter the value of given load (kN): "))
z = float(input("Enter the distance of vertical stress (m): "))
r = float(input("Enter the distance of horizontal stress (m): "))
stress = (3 * Q * (1 / (1 + (r / z) ** 2)) ** 2.5) / (2 * 3.14 * (z ** 2))
print("The value of stress is:", stress, "kN/m^2")
```

OUTPUT-

```
Enter the value of given load (kN): 2500
Enter the distance of vertical stress (m): 6
Enter the distance of horizontal stress (m): 5
The value of stress is: 8.876275703713446 kN/m^2
```