**Features**

1. User inputs using the turtle.numinput input method
2. Basic validation of user inputs

Example: min & max values

1. Storing user inputs in a text file
2. Calculation of shear forces and bending moments at each critical segment or point
3. Plotting of shear force diagram (SFD) and bending moment diagram (BMD) for
4. Simply supported beam
5. Overhanging beam
6. Cantilever beam

with

1. Concentrated loads

**Features under development**

1. Enabling plotting of SFD and BMD for beams with distributed loads and pure moments
2. Calculation of shear force and bending moment at any point of the beam using generalised functions with x as the argument

**Test Cases**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Test Description | Test Steps | Expected Result |
| 1 | Simply supported beam with concentrated loads | 1. Run the programme 2. Enter “1” for [Beam Type] 3. Enter “1000” for [Beam Length] 4. Enter “1” for [Load type] 5. Enter “-10” for [P] 6. Enter “250” for [x] 7. Enter “1” 8. Enter “20” for [P] 9. Enter “750” for [x] 10. Enter “0” |  |
| 2 | Overhanging beam with concentrated loads | 1. Run the programme 2. Enter “2” for [Beam Type] 3. Enter “1000” for [Beam Length] 4. Enter “500” for [Support Position] 5. Repeat steps 4-9 of test case #1 6. Enter “1” 7. Enter “1” for [Load type] 8. Enter “-5” for [P] 9. Enter “1000” for [x] 10. Enter “0” |  |
| 3 | Cantilever beam with concentrated loads | 1. Run the programme 2. Enter “3” for [Beam Type] 3. Enter “1000” for [Beam Length] 4. Repeat steps 4-9 of test case #1 5. Enter “1” 6. Enter “1” for [Load type] 7. Enter “10” for [P] 8. Enter “500” for [x] 9. Enter “0” |  |

**Data File Format**



Example:



**Key Strengths & Limitations**

Strengths:

1. Ease in user input
2. Generally accurate results with customised scales of axes dependent on load conditions

Limitations:

1. Only allows concentrated loads
2. Inaccuracy in SFD and BMD when there is a non-zero load at x=0 on a cantilever beam

**GitHub Repository**

https://github.com/josezhz/ma1008-mini-project