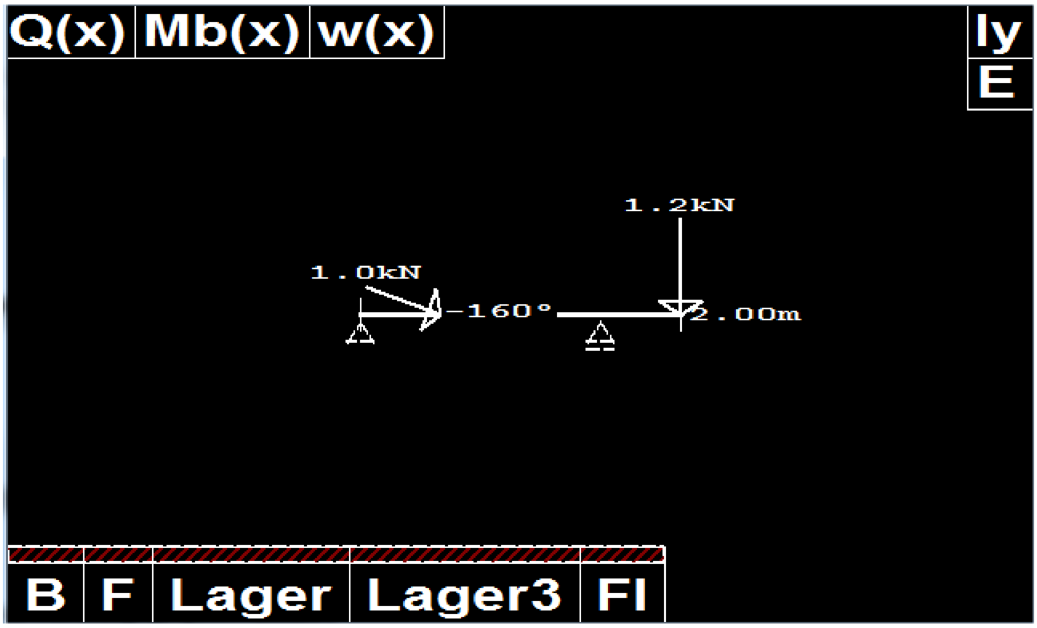

Abbildung 1: Main screen

1) Q(x) → Opens a screen that shows the transverse forces applied to the object as a graph over the length x
2) Mb(x) → Opens a screen that shows the torque as a graph over the length x
3) w(x) → Opens a screen that shows the bending as a graph over the length x
4) Iy → In the secondary command window: Asks you to choose a second moment of area for your object from a list a standardized values. Optionally lets you type in "15" to type in any value in Millimeter to the power of 4.
5) E → In the secondary command window: Asks you to type in data of your object in the following order:
    1. Length of your object in the unit meters
    2. quantity of known point forces
        I. Amount of point force 1 in Newton
        II. Position of point force 1 in meters relative to the left end of the object
        III. Angle of point force 1 in degree. 270° means vertically downwards
        IV. Repeat steps I to III for each force
    3. Quantity of known distributed loads
        I. Position of the left end of distributed load 1 in meters relative to left the end of the object

   II. Length of distributed load 1 in meters
   III. Force density at the starting position of the distributed load in Newton per meter
   IV. Force density at end position of the distributed load in Newton per meter
   V. Repeat steps 1 to IV for each load
4. Does it have a fixed support? Answer using 1 as yes and 0 as no.
   I. If “0”:
   II. Position of hinged support in meters relative to the left end of the object
   III. Position of movable support in meters relative to the left end of the object
5. Young’s modulus in Newton per Millimeter squared
6. Second moment of area from a list of 14 standardized values. Optionally type in “15” to use any value.
   I. In case of using your own value, it also requires to type in the maximum distance from center to the top edge of the profile of the object. This is necessary for the calculation of the section modulus from the moment of area.

6) B →creates a rod on the screen. The right end can be dragged using the left mouse button to increase or decrease length. If higher precision is necessary, use “E” button in the main screen instead and manually type in the exact values.
7) F →creates a force on the rod that faces downwards. Requires a rod to exist. Forces can be dragged along the rod using left mouse button. Can also be dragged up and down using left mouse button to increase or decrease force. Forces can also be rotated using right and left mouse button simultaneously. For higher precision use “E” button in main screen to construct manually using exact values.
8) Lager → creates a hinged support. On second usage creates a movable support. The maximum is 2 supports. Both can be dragged along the rod

using the left mouse button. For higher precision use „E“ button in the main screen to construct manually through exact values.

9) Lager3 → creates fixed support. Requires a rod and no other supports to exist. Can be dragged using the left mouse button, but isn’t necessarily helpful since the fixed support should optimally be at the end of a construct.
10) Fl → creates distributed load. Can be dragged using left mouse button. Dragging the left or right end enables changing the Force density by moving up or down. For higher precision use “E” button in main screen to construct manually from exact values.
11) Red Buttons → Delete buttons of their respective parts. Removes in opposing order to creation (e.g. last spawned instance of force will be deleted first).

1 Workflows

Using either the graphical interface or the cmd window it’s possible to use approximate values by dragging objects using the cursor or exact values by typing them in.

1.1 Using approximated values

1) Create a rod using “B”-button
2) Change the length of the rod by pulling its right end using the left mouse button
3) Create either a fixed support or both a hinged and movable support using either “Lager3” once or “Lager” twice
4) Move the supports to the approximated position by dragging them with the left mouse button
5) Create as many forces and distributed loads as necessary
6) Move the forces and loads to the approximated position
7) Change the amount of force and force density to the approximated amounts
8) Press “Iy” and go from the main screen to the secondary command window. It shows a written list of 14 different standardized values for the moment of

area. Either pick one of them by typing in the respective number of the entry or type “15” to set an arbitrary value. In case of an arbitrary value also requires the vertical distance from the profiles center to the top edge.

9) Go back to the main window and open one of the graphs by clicking on Q(x), M(x) or w(x) and see the results. By opening the M(x) graph the command window will also display the maximum tension within the rod and where it is.

1.2 Using exact values

1) Click “E”-button
2) Go to the secondary command window and follow directions according to the explanations in 3.1.
3) Go back to the main window and check the screen. It should show the rod and its parts positioned correctly.
4) Go back to the main window and open one of the graphs by clicking on Q(x), M(x) or w(x) and see the results. By opening the M(x) graph the command window will also display the maximum tension within the rod and where it is.