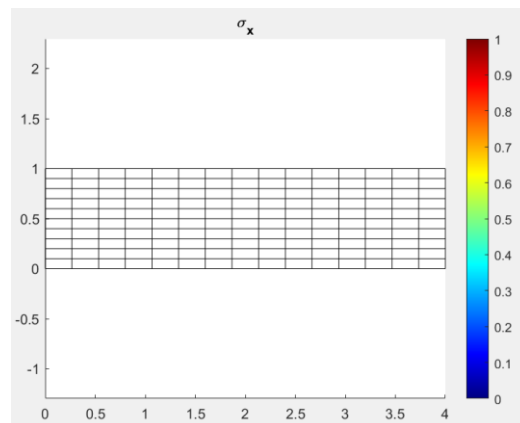


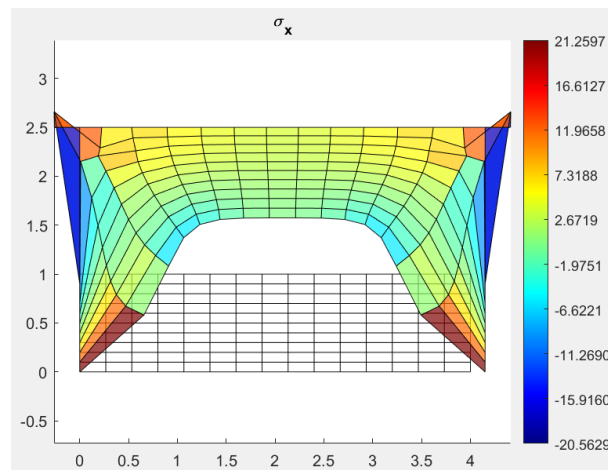
Finite Elements – Nafih Mohammed

The aim of this project was to solve a plane stress equilibrium problem of stretched a bar. The bar was fixed at the right at left ends, but the top and bottoms sides were traction free.

In order to simulate a stretch on the bar, Dirichlet boundary conditions were applied, with the x and y coordinates of both ends fixed, but a stretch in the x direction of the right end was applied. An undeformed bar was expected as both ends were fixed and there was no external force present. This resulted in a plot:



Next, a bend was also applied to the bar in the y-direction, for a combined stretching and bending load. To achieve this, the bend had to be applied to the top edge, which resulted in a plot:



From the plot, it is apparent that the fixed corners of the left and right edges experience the most stress. The underside of the bar experiences mostly compression, whilst the top bar is under tension.