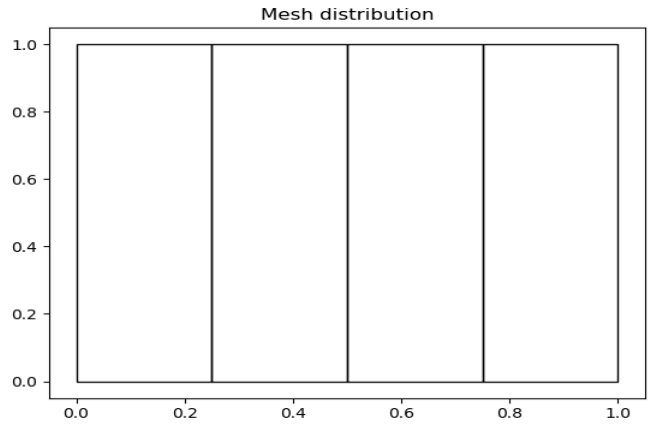
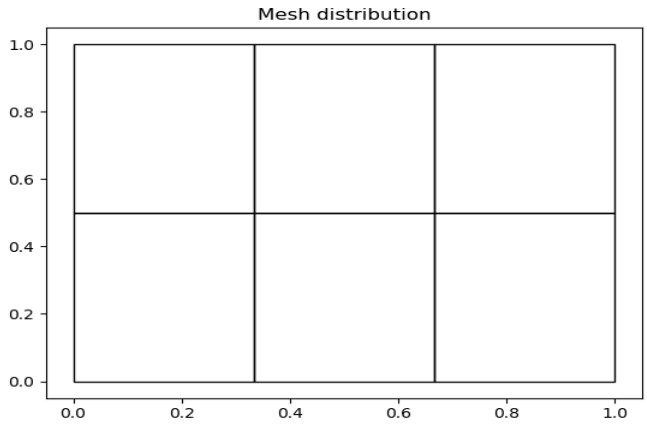
The divergence operator for AC space is checked with following different mesh distributions and with velocities

$$\boldsymbol{u} = [x - y, x + y] \quad \boldsymbol{u} = [-y, x] \quad \boldsymbol{u} = [x - y, x - 2y]$$

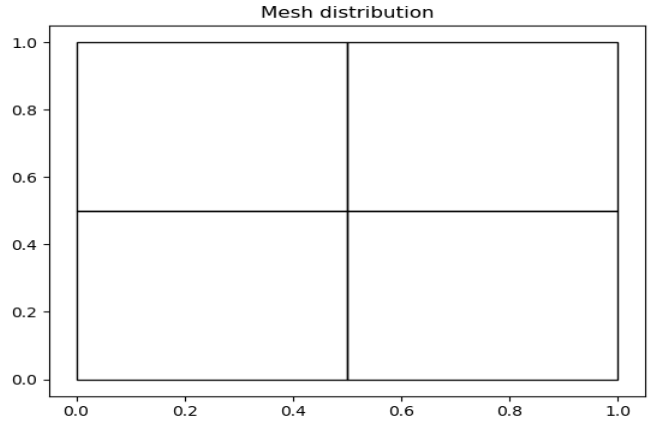
All passed



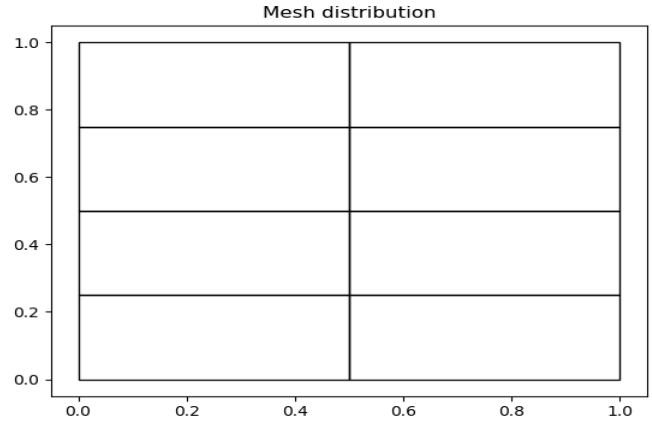
(a) nelx = 4, nely = 1



(b) nelx = 3, nely = 2

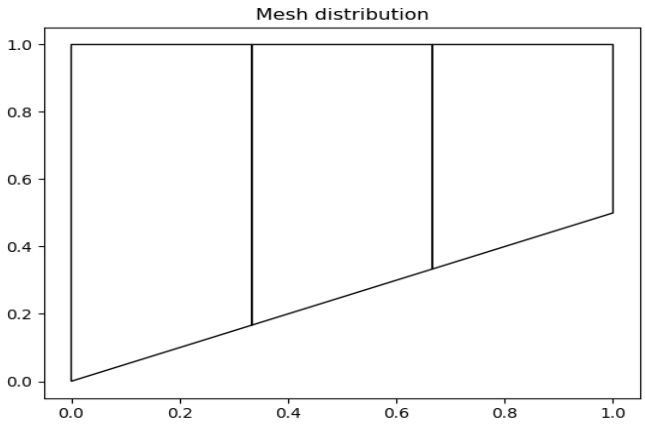


(c) nelx = 2, nely = 2

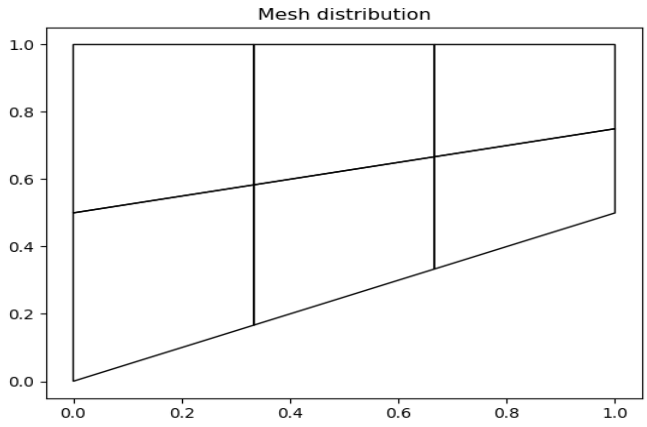


(d) nelx = 2, nely = 4

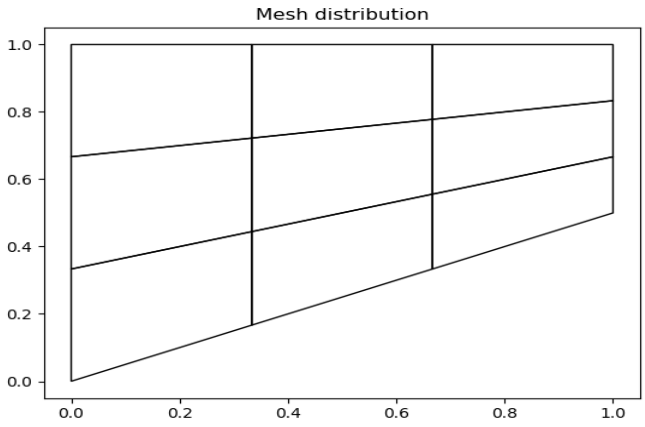
Figure 1: Uniform mesh distribution for testing divergence operator



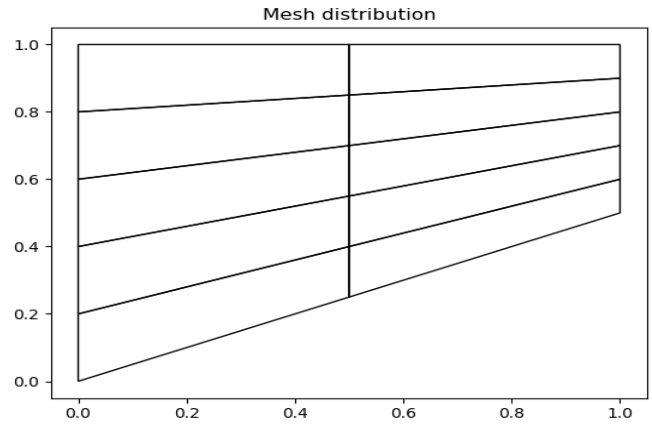
(a) nelx = 3, nely = 1



(b) nelx = 3, nely = 2

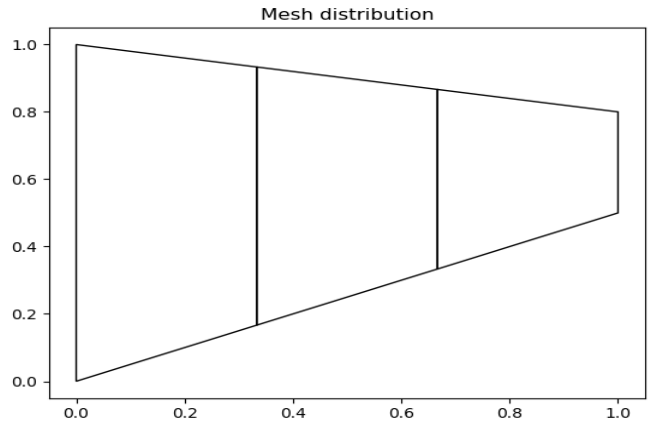


(c) nelx = 3, nely = 3

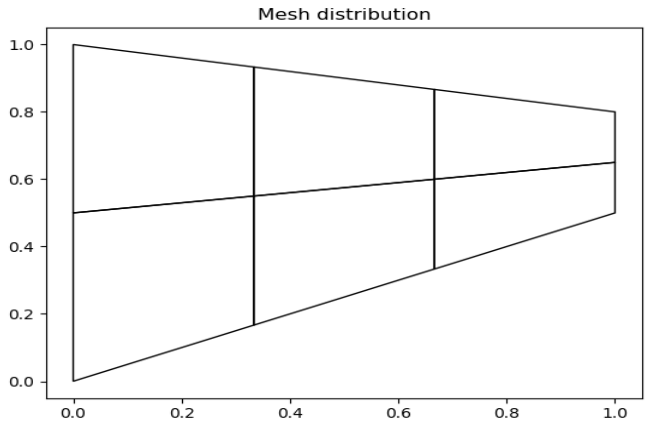


(d) nelx = 2, nely = 5

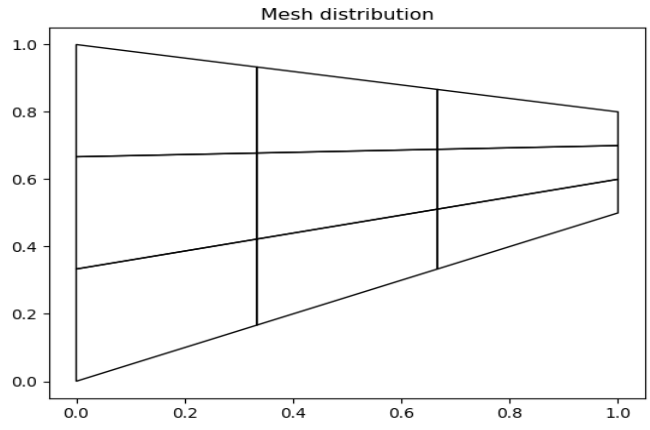
Figure 2: Nonuniform mesh distribution for testing divergence operator. Bottom line geometry is $y = 0.5x$



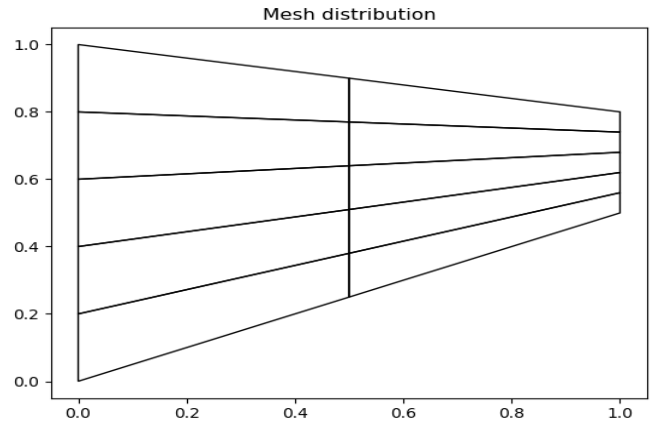
(a) nelx = 3, nely = 1



(b) nelx = 3, nely = 2

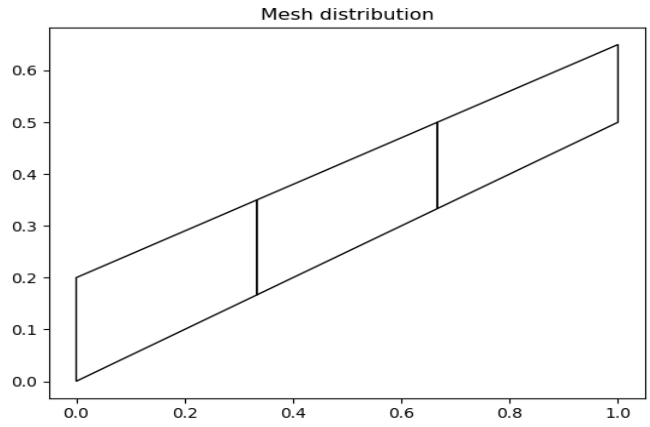


(c) nelx = 3, nely = 3

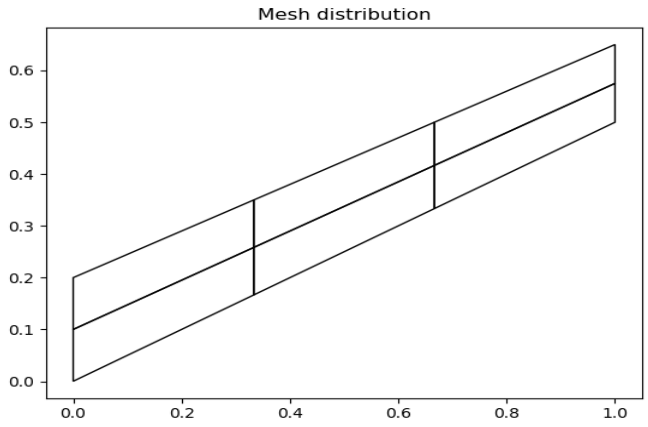


(d) nelx = 2, nely = 5

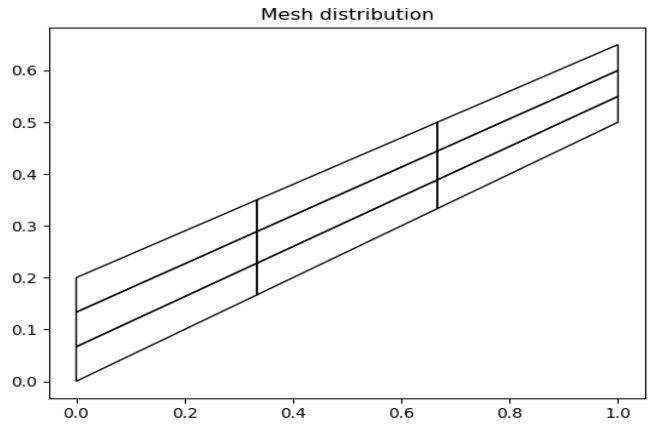
Figure 3: Nonuniform mesh distribution for testing divergence operator. Bottom line geometry is $y = 0.5x$ and top line is $y = 1 - 0.2x$.



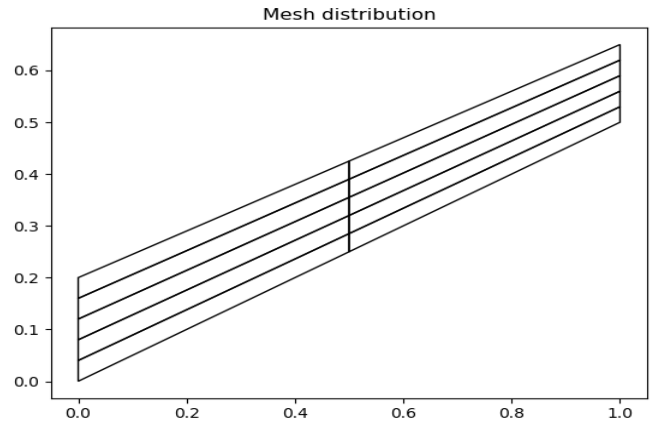
(a) nelx = 3, nely = 1



(b) nelx = 3, nely = 2

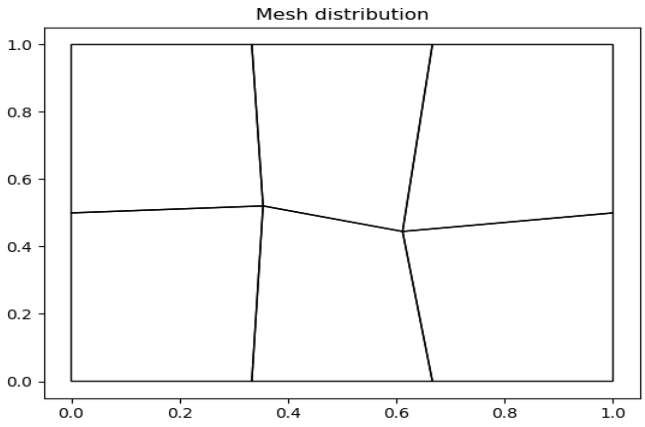


(c) nelx = 3, nely = 3

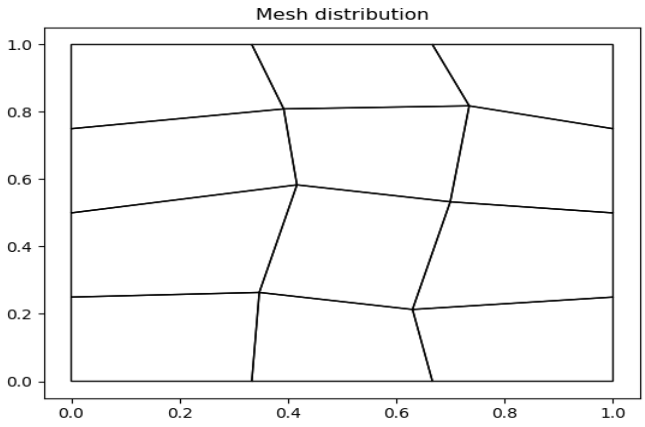


(d) nelx = 2, nely = 5

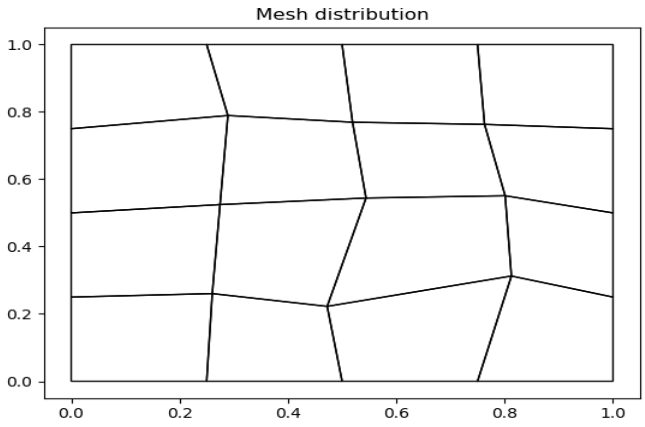
Figure 4: Stretched mesh distribution for testing divergence operator. Bottom line geometry is $y = 0.5x$ and top line is $y = 0.2 + 0.45x$



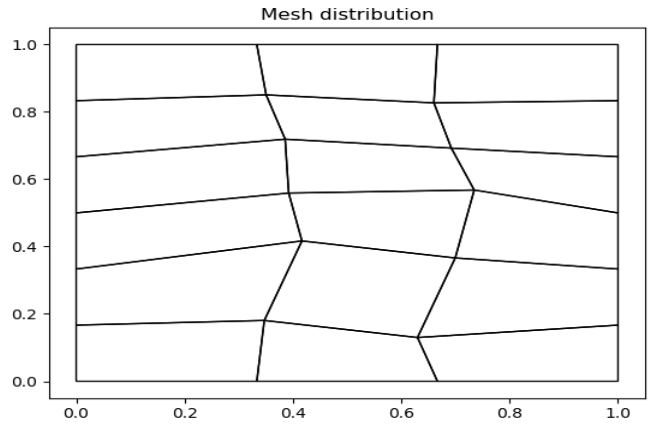
(a) nelx = 3, nely = 2



(b) nelx = 3, nely = 4



(c) nelx = 4, nely = 4



(d) nelx = 3, nely = 6

Figure 5: Random mesh distribution for testing divergence operator.