MECE5397 / 6397
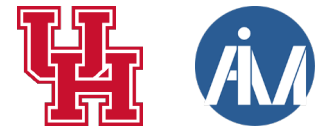# Assignment 4:
Topology optimization
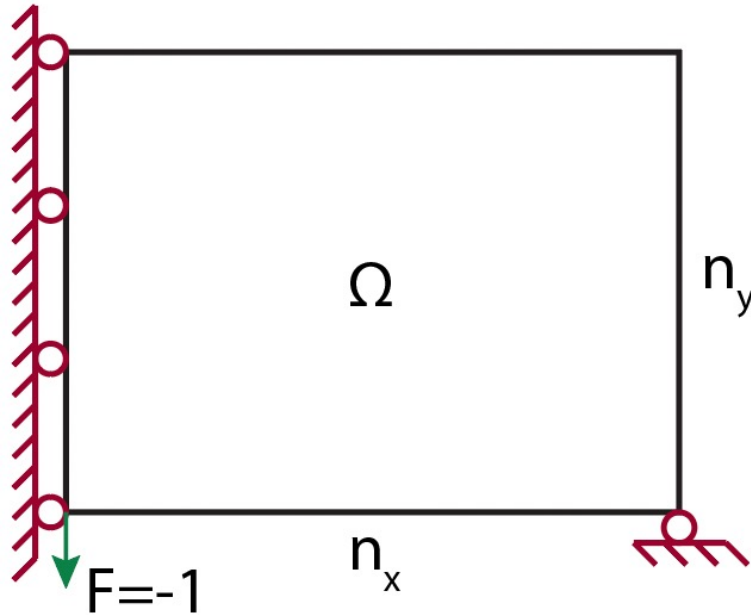
Tian Chen, Dr. sc.

Department of Mechanical Engineering

Task 1 – Derive the element stiffness matrix

Task 2 – Derive the element DOF Matrix

Task 3 – Code an finite element solver

Task 4 – Implement the filter function

Task 5 – Code optimality criteria

Task 6 – Implement the SIMP algorithm
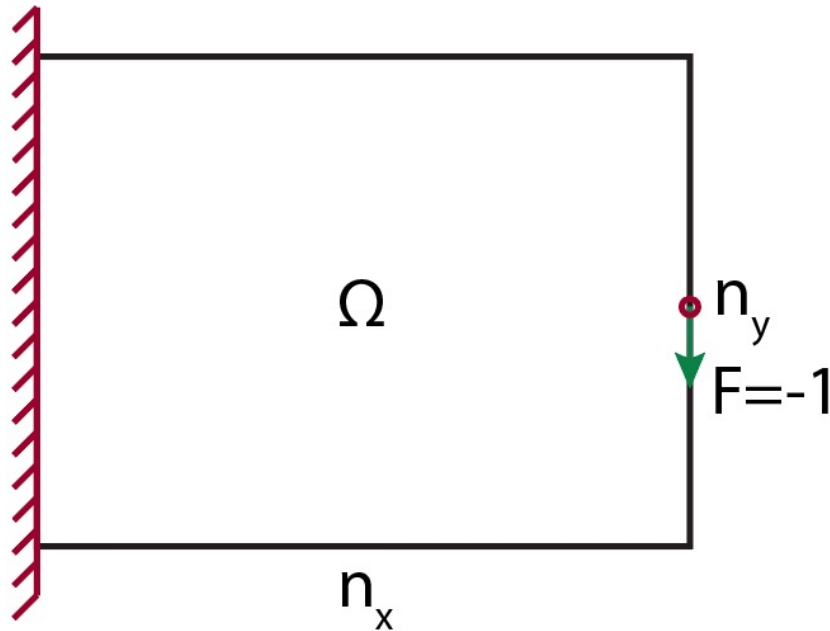
Task 7 – Design and plot an interesting structure

Test case 1

Left wall is constrained in x but free in y
Bottom right corner is constrained in y but not x

A concentrated load is applied in the –y direction at the left bottom corner of magnitude 1

Test case 2

Left wall is constrained in both x and y

A concentrated load is applied in the –y direction
In the middle of the right wall of magnitude 1