

COMPUTATIONAL MECHANICS TOOLS

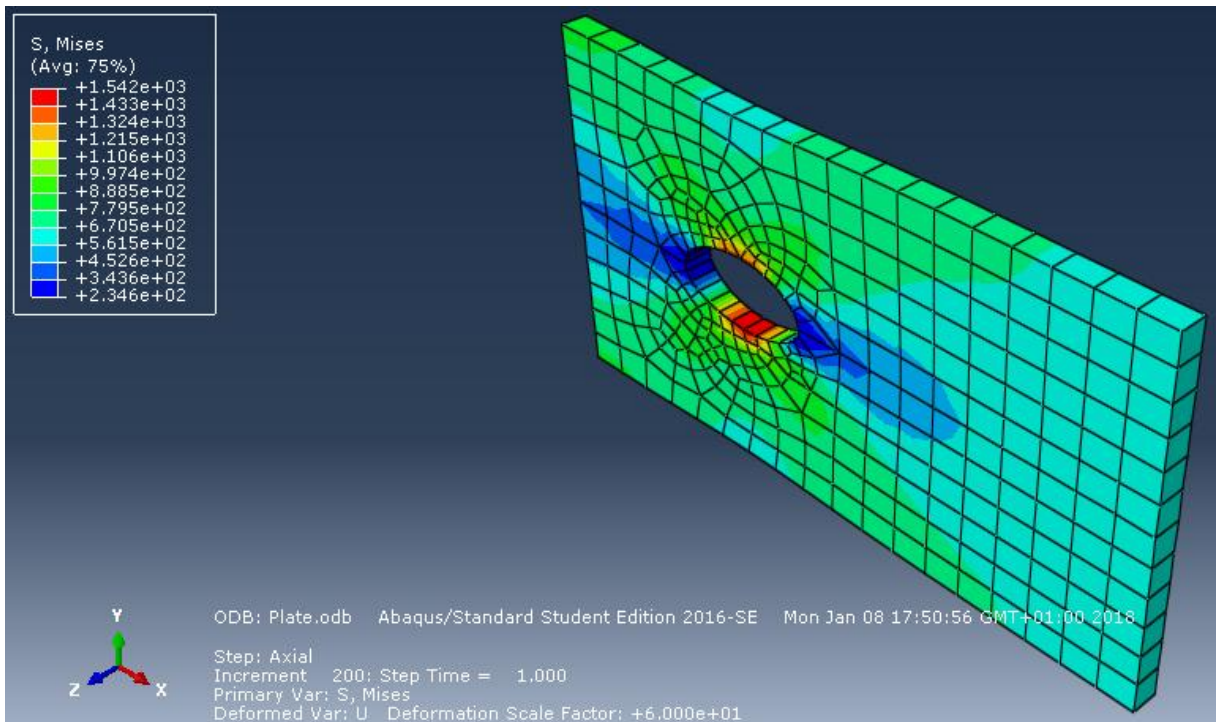
ASSIGNMENT 3: NONLINEARITY

PAULINA ANDRUSZKO

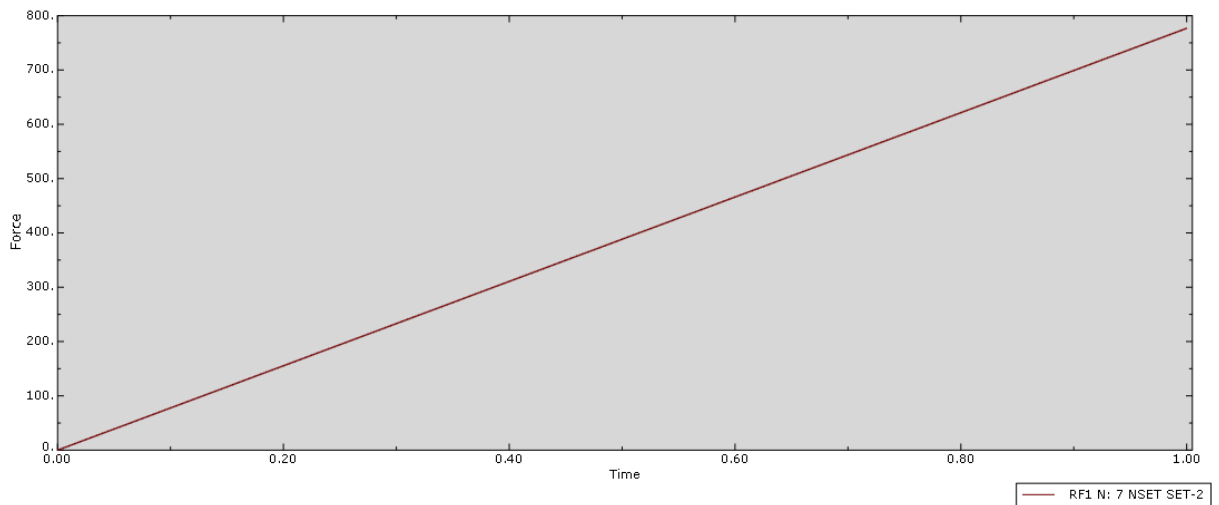
PROBLEM 1 - STEEL PLATE WITH A HOLE

A) ELASTIC MATERIAL

1. Plot the distribution of Von Mises stresses in the plate

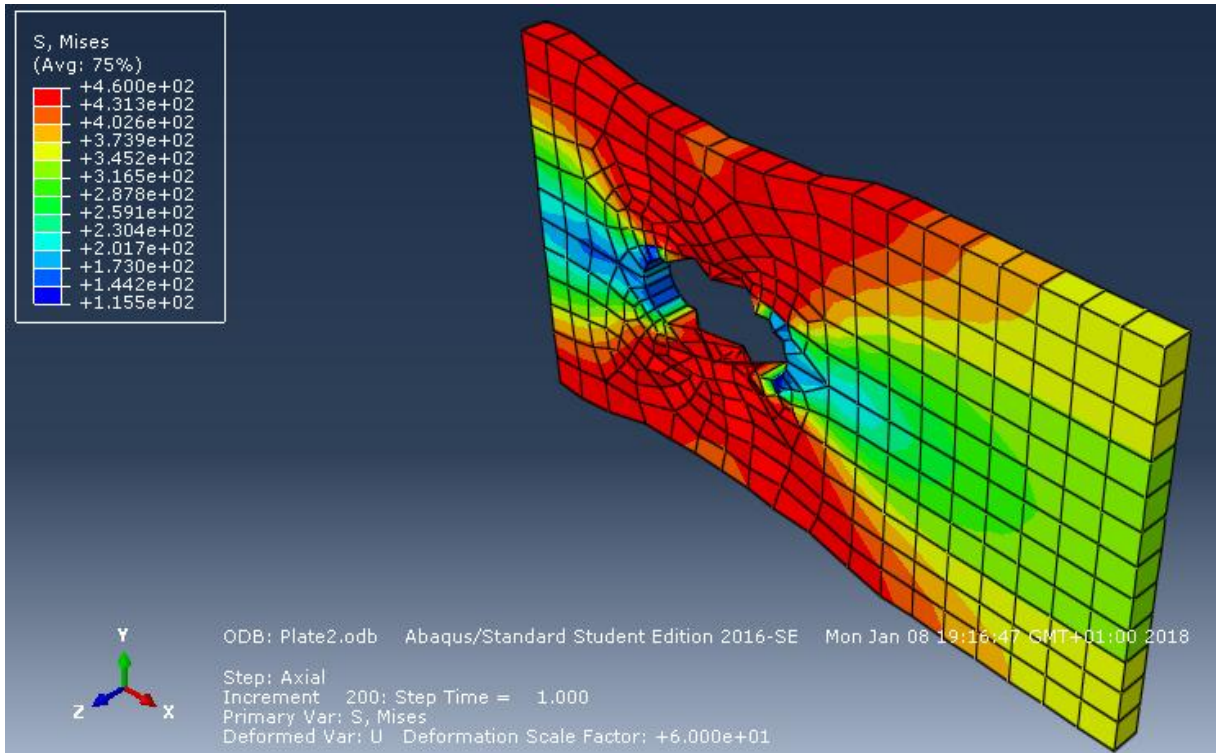


2. Plot the force-time curve at point-set

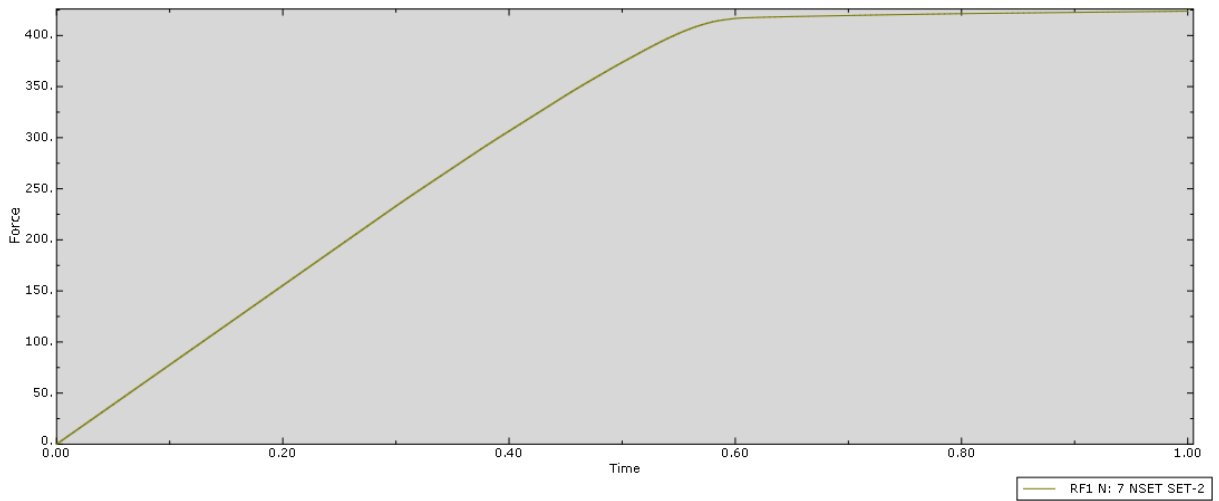


B) PLASTIC MATERIAL $f_y = 460 \text{ N/mm}^2$

1. Plot the distribution of Von Mises stresses in the plate

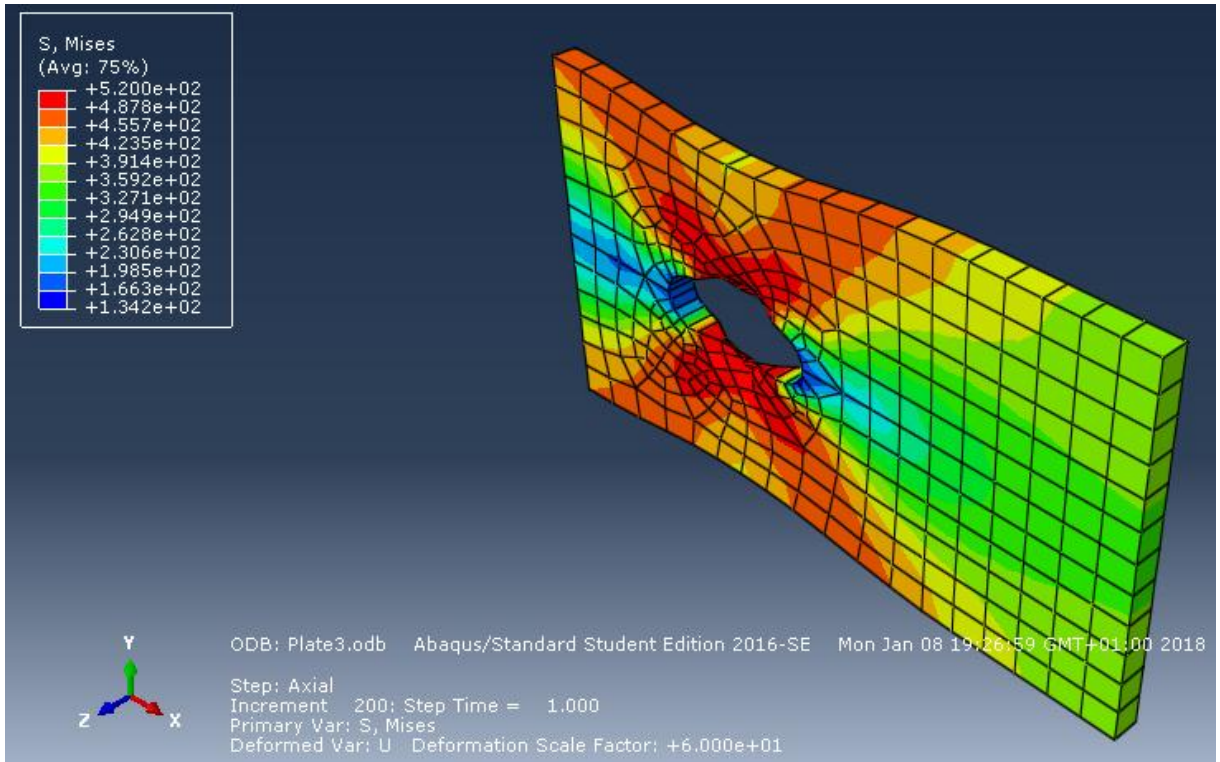


2. Plot the force-time curve at point-set

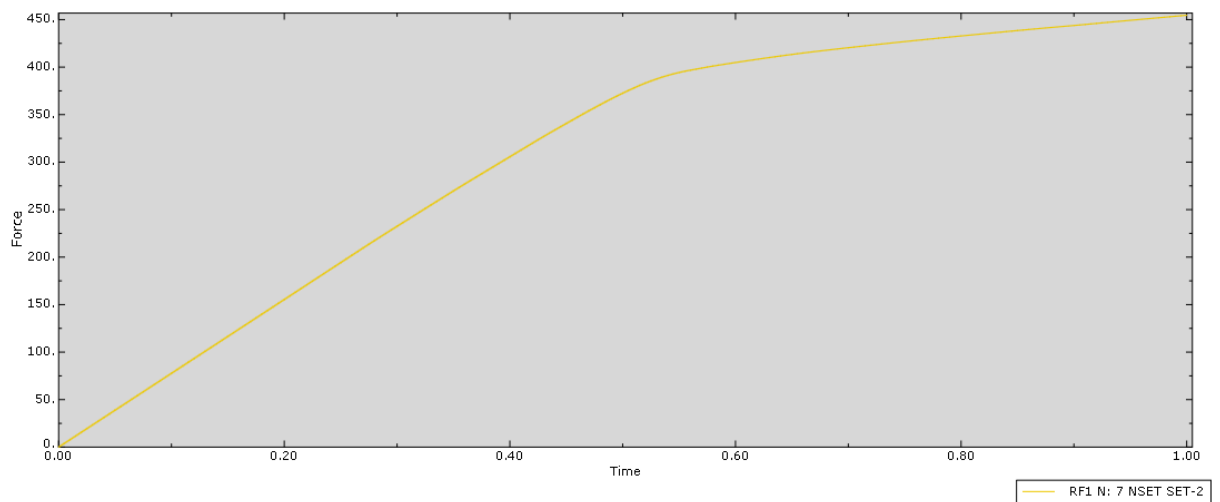


C) MATERIAL WITH $f_y = 460$, plastic strain = 0, $f_{y2} = 520$, plastic strain = $5E-3$

1. Plot the distribution of Von Mises stresses in the plate

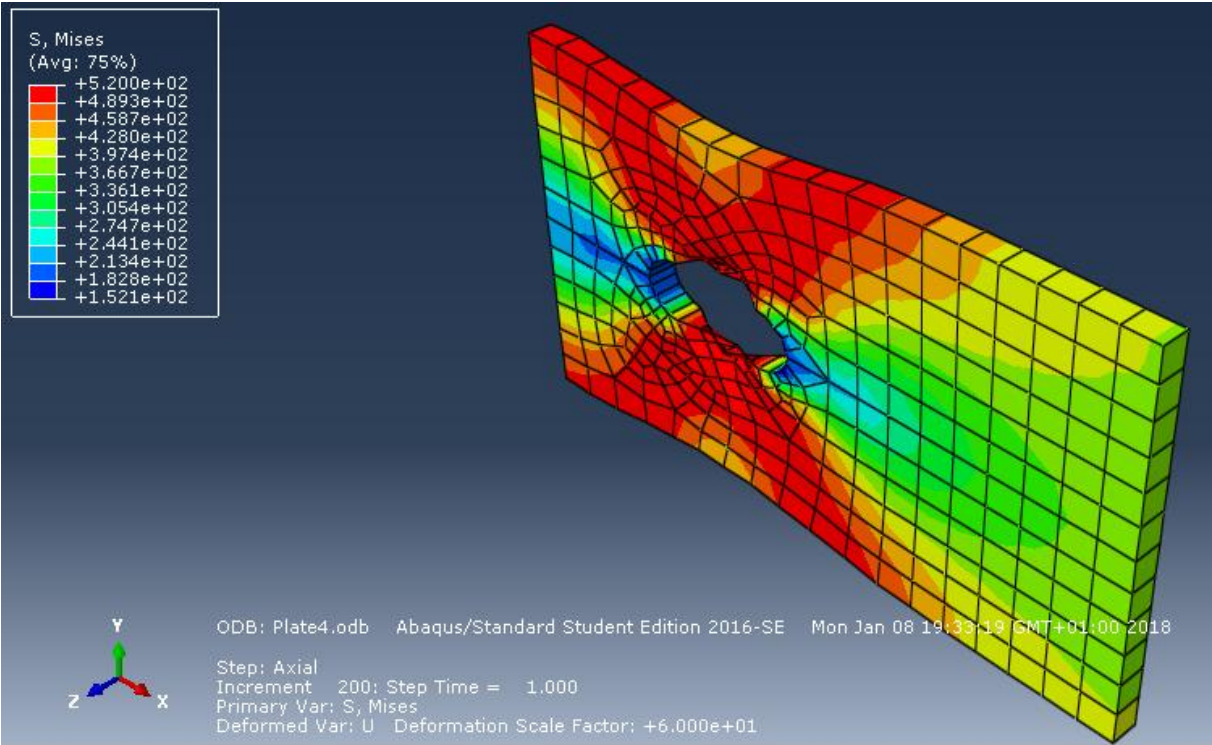


2. Plot the force-time curve at point-set

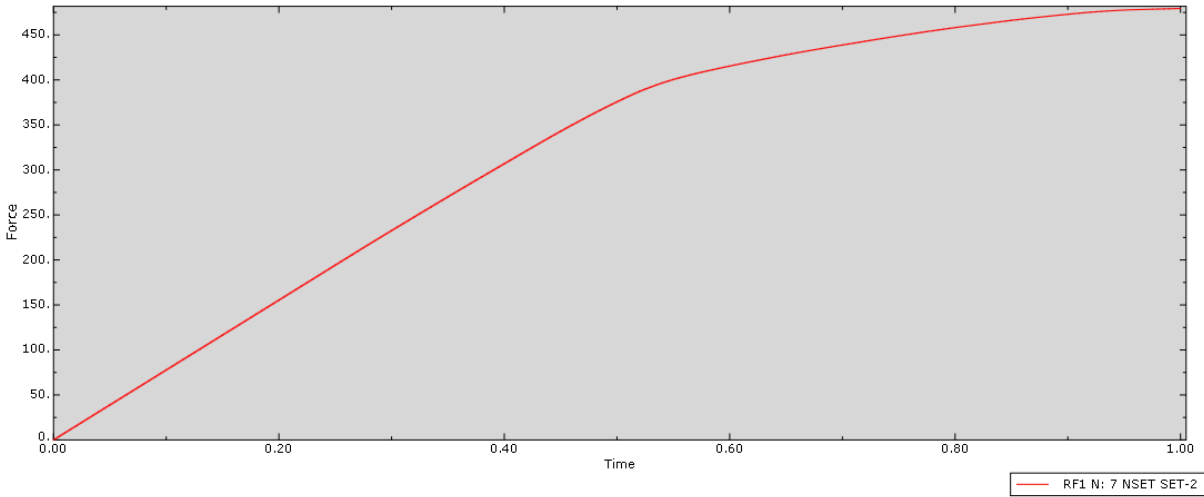


D) MATERIAL WITH $f_y = 460$, plastic strain = 0, $f_{y2} = 520$, plastic strain = $2E-3$

1. Plot the distribution of Von Mises stresses in the plate



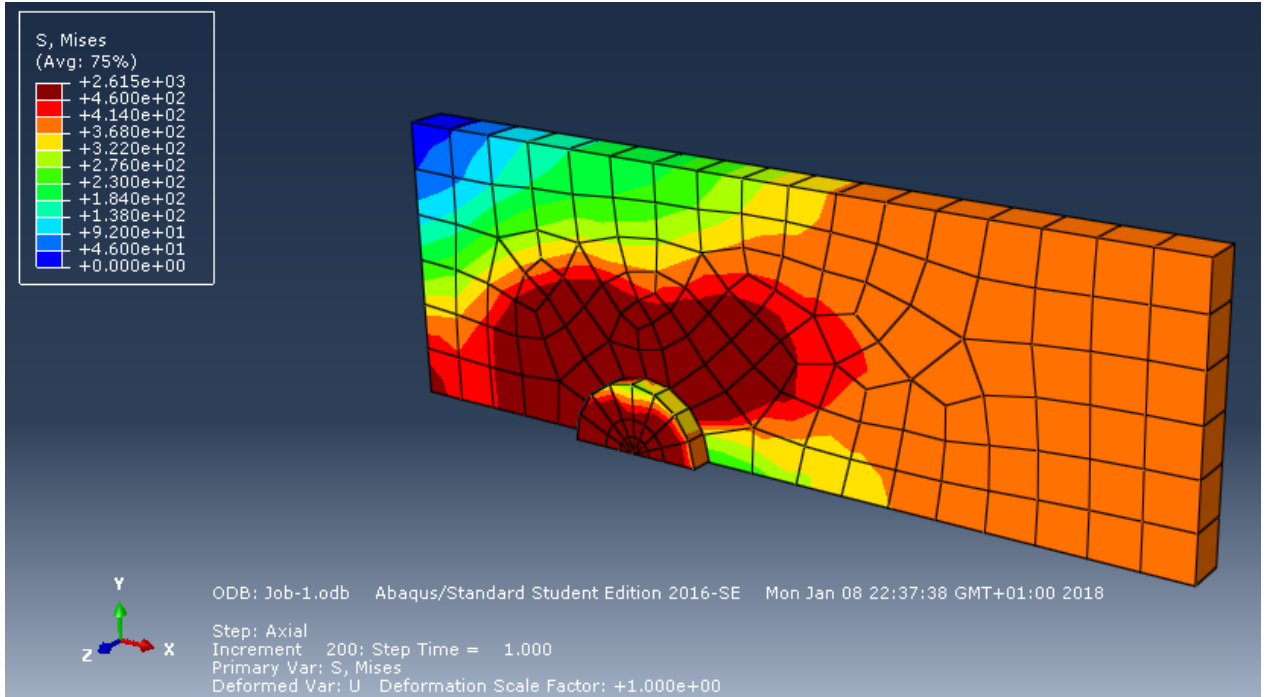
2. Plot the force-time curve at point-set



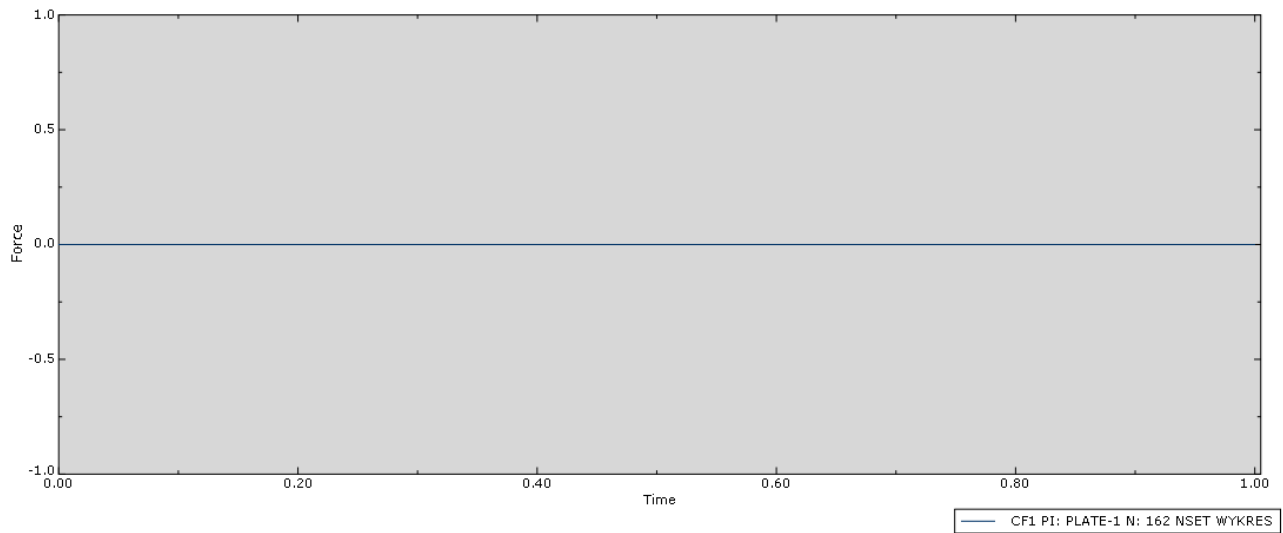
PROBLEM 2 - PLATE WITH A FIXED PIN

A) ELASTIC MATERIAL

1. Plot the distribution of Von Mises stresses in the plate



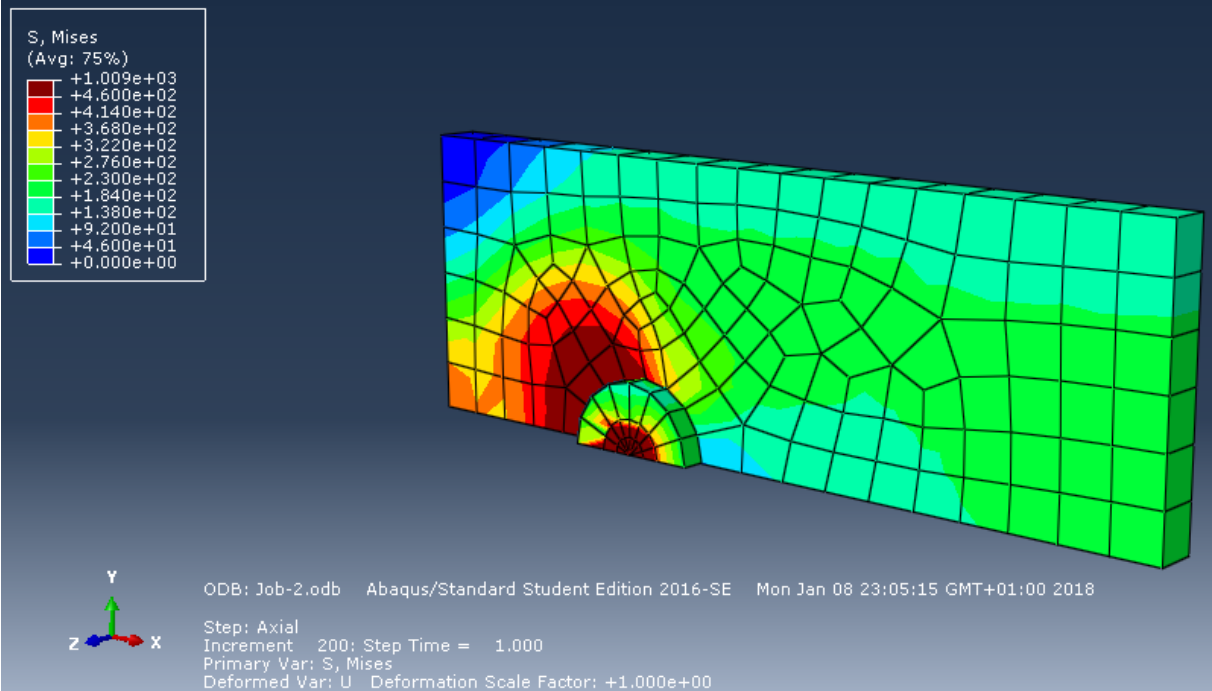
2. Plot the force-time curve at point-set



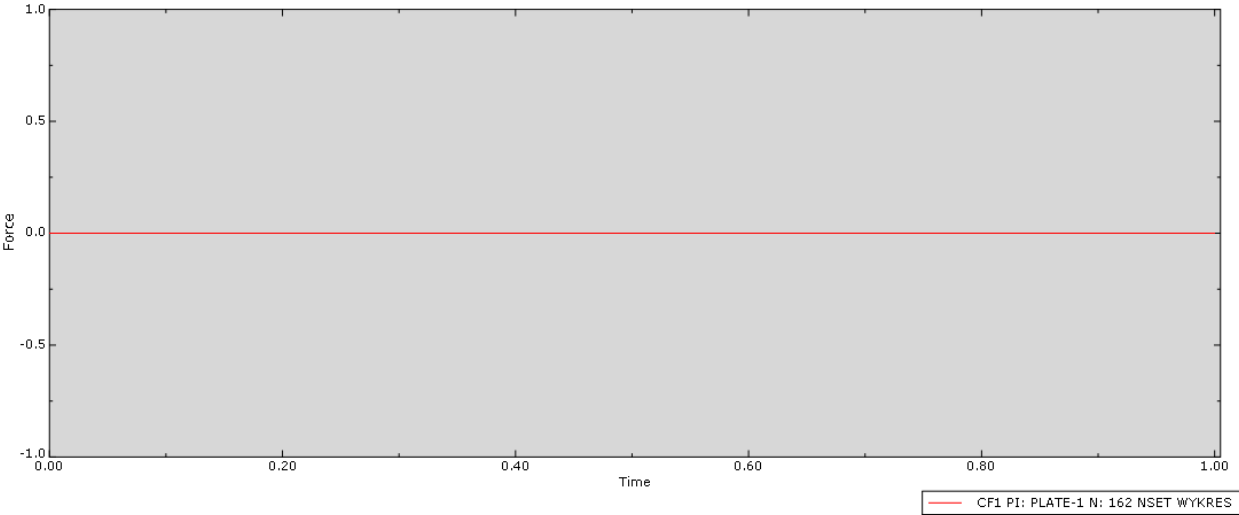
B) Plate: MATERIAL WITH $f_y = 460$, plastic strain = 0, $f_{y2} = 520$, plastic strain = $5E-3$

Pin: MATERIAL WITH $f_y = 900$, plastic strain = 0, $f_{y2} = 1000$, plastic strain = $2E-3$

1. Plot the distribution of Von Mises stresses in the plate



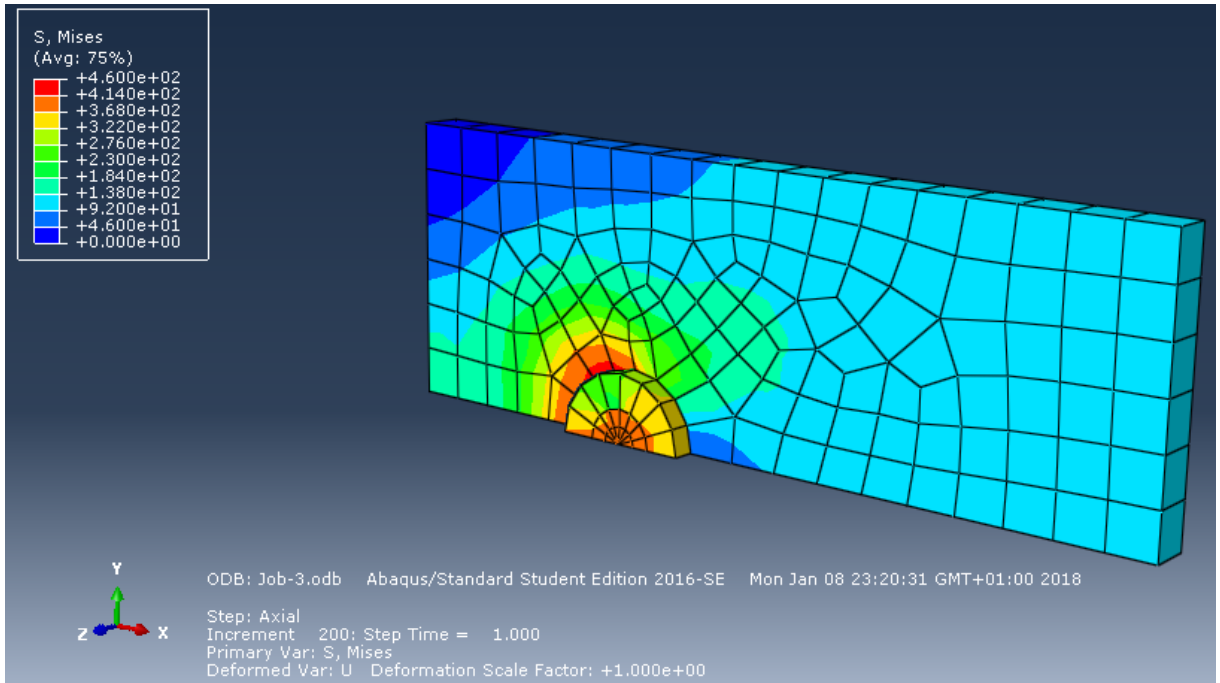
2. Plot the force-time curve at point-set



C) Plate: MATERIAL WITH $f_y = 460$, plastic strain = 0, $f_{y2} = 520$, plastic strain = $5E-3$

Pin: MATERIAL WITH $f_y = 320$, plastic strain = 0, $f_{y2} = 400$, plastic strain = $5E-3$

1. Plot the distribution of Von Mises stresses in the plate



2. Plot the force-time curve at point-set

