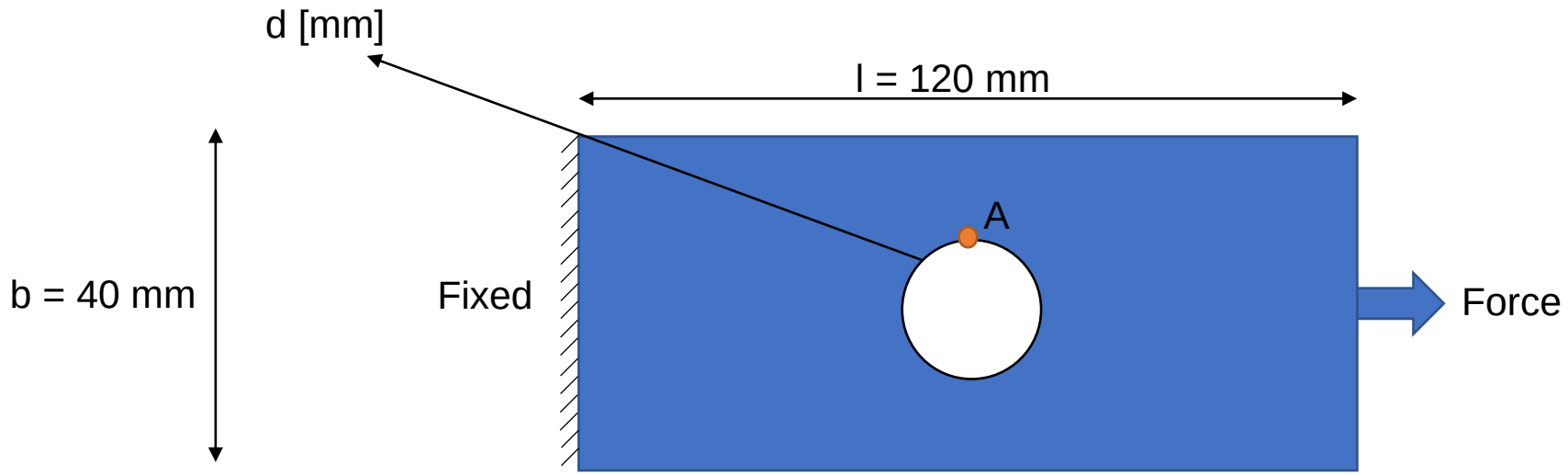
Project 1 (5 Points)

Description of the project: Sketch the model. Introduce a new material and apply the given properties to the material. Apply boundary conditions. Mesh the geometry. Find the stress concentration at point A by using the parametrization option. Finally, compare the results to the data on the following page. You should also digitize the plot on the following page and create a new single graph with your results and the digitized data. Discuss the graph, make your comments, and compare the results (to get full credit, please follow the instructions on the next page).



Change the diameter of the hole over the interval below:

$0 < d/b \leq 0.6$

t = 5 mm (into the page)

Force = 2 kN

E = 210 GPa

v=0.33

Density = 2900 kg/m^3

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a) Use the provided project report template.
b) Digitize the plot available for stress concentration factor in the book **(Figure 4.40)** for unloaded hole.
c) ANSYS: Report nominal and maximum stress at the center cross section for each value of hole diameter.
d) Using the ratio of maximum and nominal stresses for different hole radii, plot your calculated stress concentration factor as individual points on the digitized graph of stress concentrations. **(At least 10 different hole radii in the specified range.)**
e) Please comment on the reason for deviations between the two plots, if any.
f) Upload your Ansys file and the report (max. 10 pages including the title page) to Blackboard due **11:59 PM November 25, 2022**.

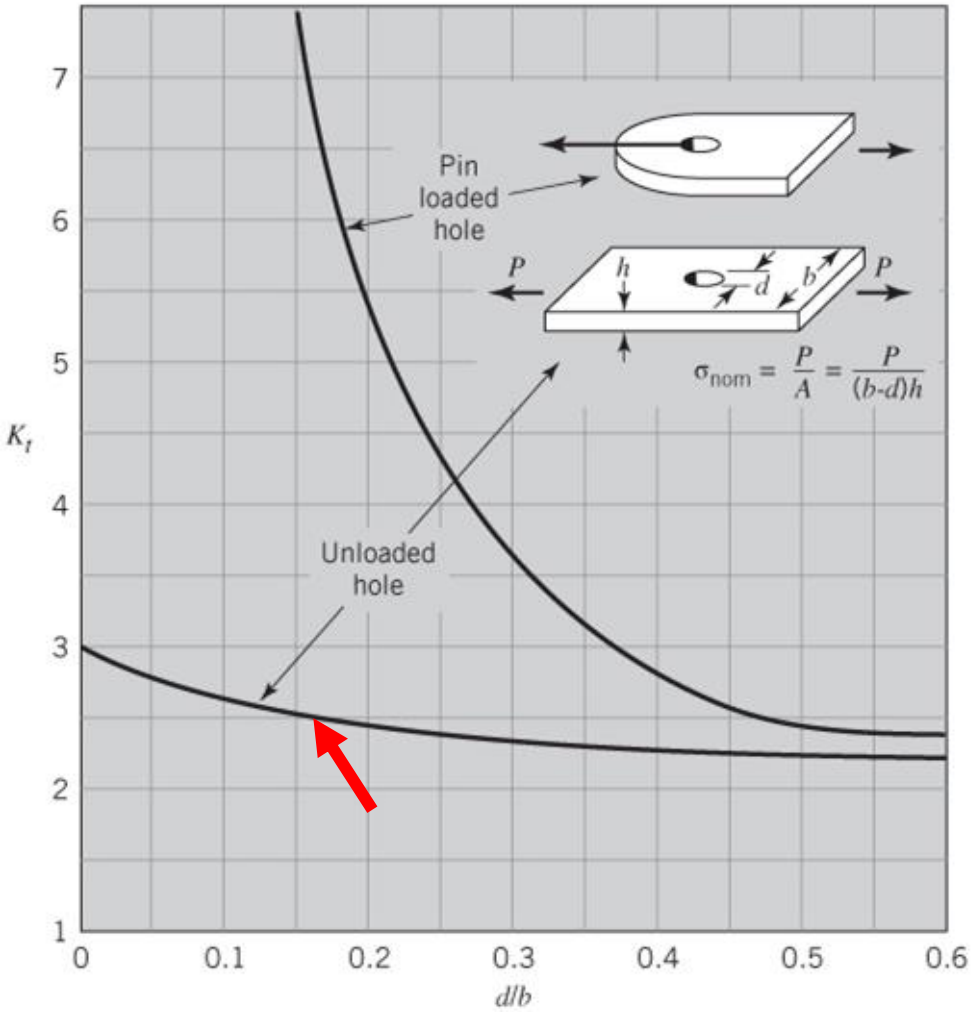

Figure 4.40

Notes

- Please utilize the Ansys software for simulation.
- Reporting figures for each simulation case is not necessary.
- Please submit your ANSYS simulation file along with the Assignment.
- You can use any available digitizer tools for digitizing the plot available in the textbook. (https://apps.automeris.io/wpd/)

- Deadline for submission: 25th November at Midnight (11:59 PM)
- Submit your assignment as a zipped file through Blackboard.