# AIM Stepped Shaft in Axial Tension - Pre-Analysis

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## Pre-Analysis & Start Up

### Calculation

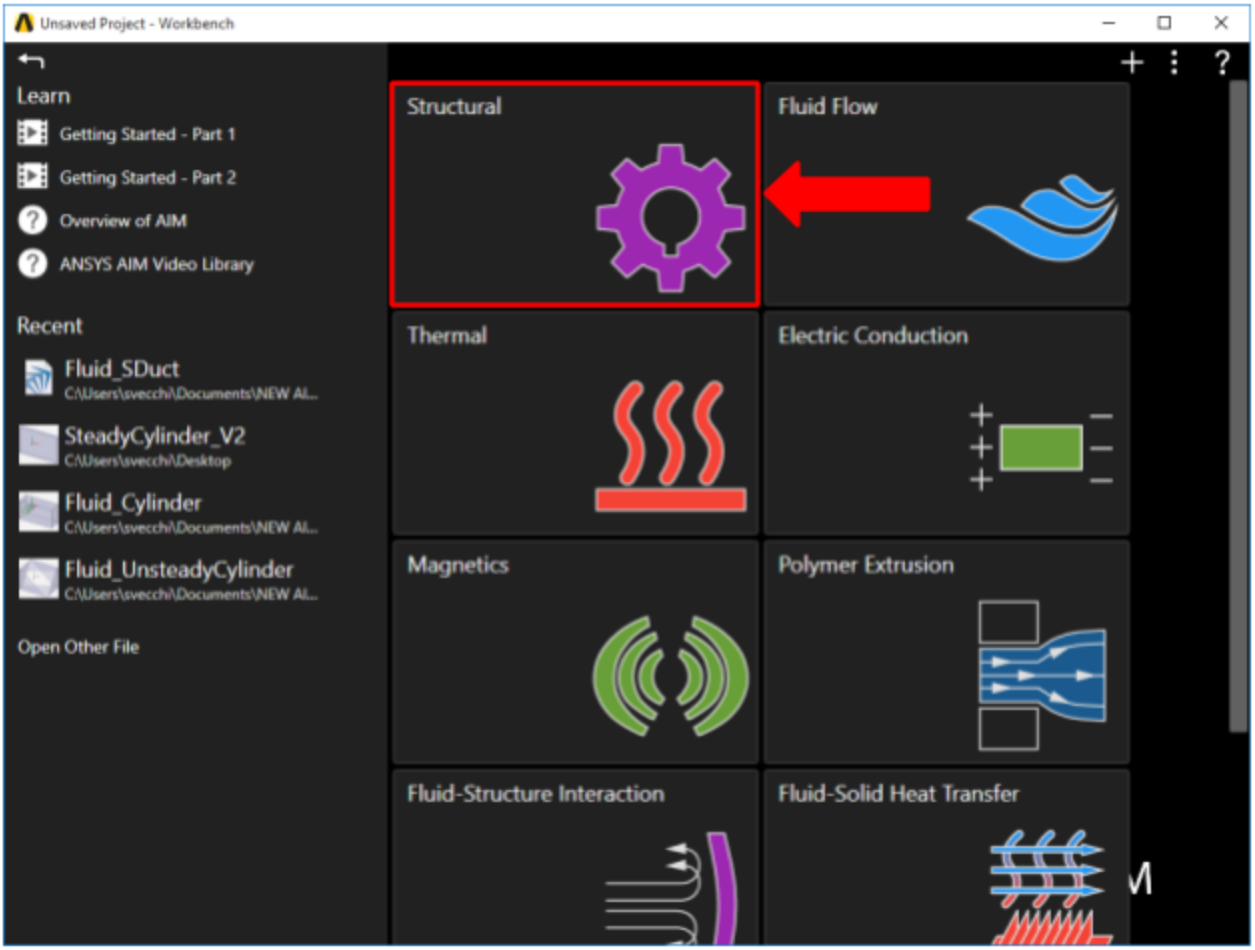
It is recommended that you make some back-of-the-envelope estimates of expected results before launching into your computer solution. Here:

for which the following formula for the axial stress concentration factor, K, holds (Roark's Formulas for Stress and Strain, Warren C. Young and Richard G. Budynas, 2002):

We'll compare the above axial stress concentration factor to the value obtained from ANSYS.

### Start-Up

Now that we have the pre-calculations, we are ready begin simulating in ANSYS AIM. Open ANSYS AIM by going to **Start** > **All Apps** > **ANSYS 18.1** > **ANSYS AIM 18.1**. Once you are at the starting page of AIM select the **Structural** template in the top left corner as shown below.




You will be prompted by the **Structural Template** to either **Define new geometry**, **Import geometry file**, or **Connect to active CAD session**. Select **Define new geometry** and press **Next**, then press **Finish** on the next panel. For this problem, we will be using the static calculation type. The **Model Editor** will launch automatically. In order to use the units given to us in the problem, press the **Home** button in the top left corner and select **Units** > **U.S. Engineering**.

**Go to Step 2: Geometry**

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