Report

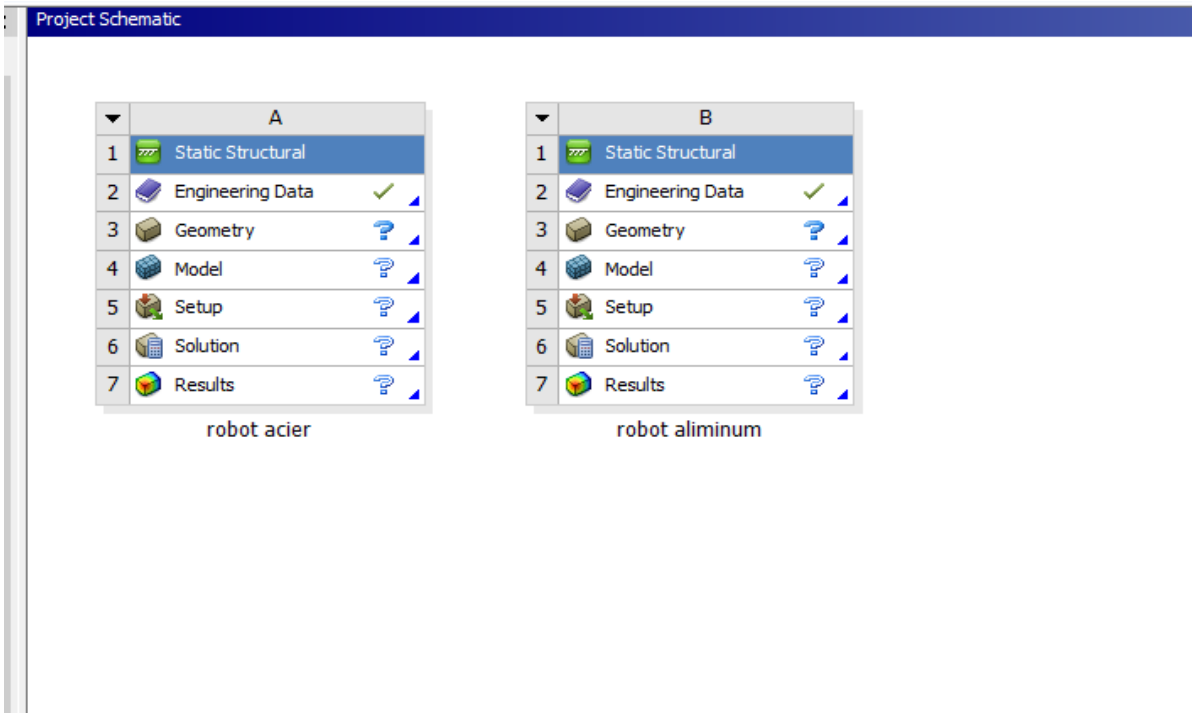
Nom et Prenom	Iheb Kadri

In the project, two simulation blocks were created using Ansys static structural analysis, designated as "Steel Robot" and "Aluminum Robot." Each block incorporated the provided industrial robot model, with the robot's height determined to be 1.342 m.

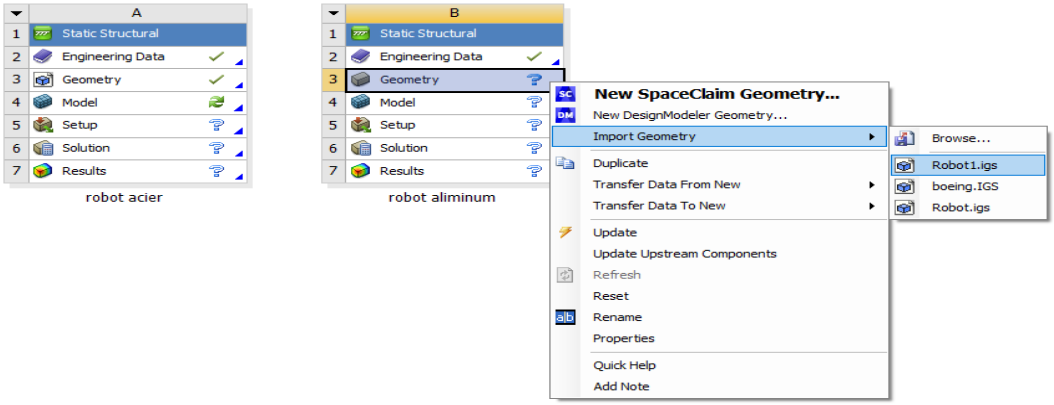
To analyze the material properties, aluminum alloy was added to the Aluminum Robot block, while the presence of structural steel was confirmed for the Steel Robot block. Following this, the masses of the two robots were compared: the Steel Robot had a mass of 657.34 kg, whereas the Aluminum Robot weighed 231.95 kg.

The next step involved simulating the impact of a static load equivalent to 30 kg positioned under the beak of both robots. This required applying a fixed support and calculating the force as F=m·g=30·9.8=294NF = m \cdot g = 30 \cdot 9.8 = 294 NF=m·g=30·9.8=294N.

Subsequent analyses focused on the maximum deformations and stresses experienced by each robot under this load. With the yield strength of steel established at 520 MPa and that of aluminum at 420 MPa, the study concluded by assessing the resistance of both robots to the applied stresses, highlighting the implications for design choices in industrial applications.



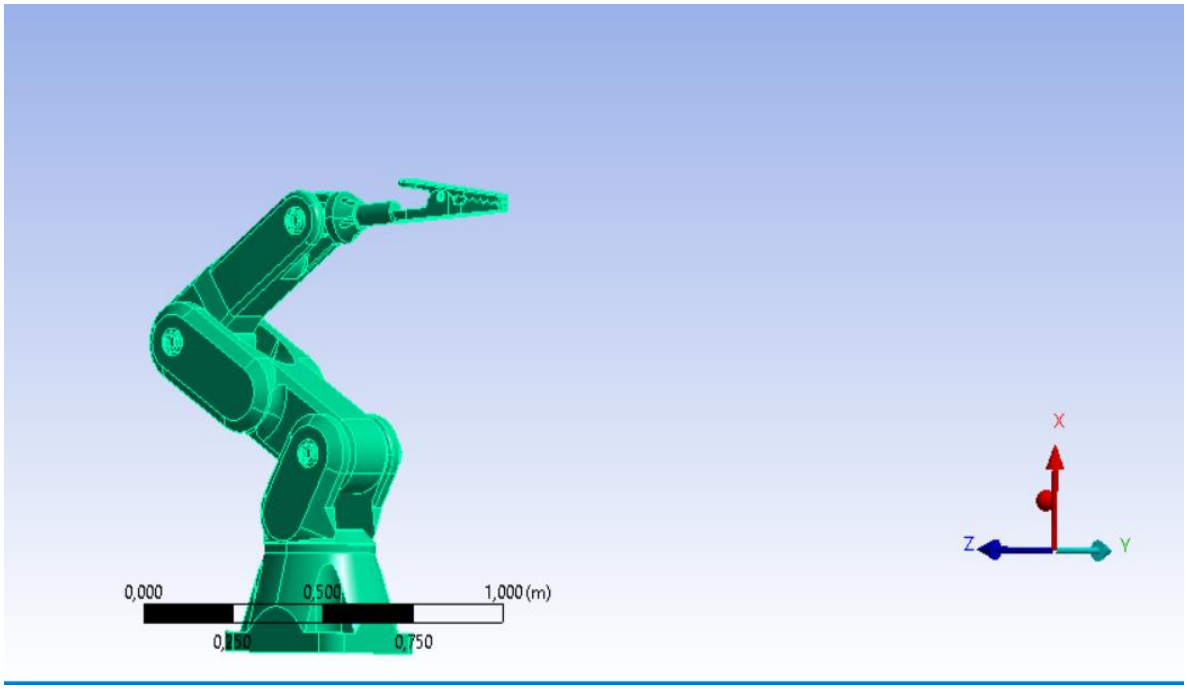
1. In each of the blocks importing the industrial robot provided



2. Calculating the Heigth :

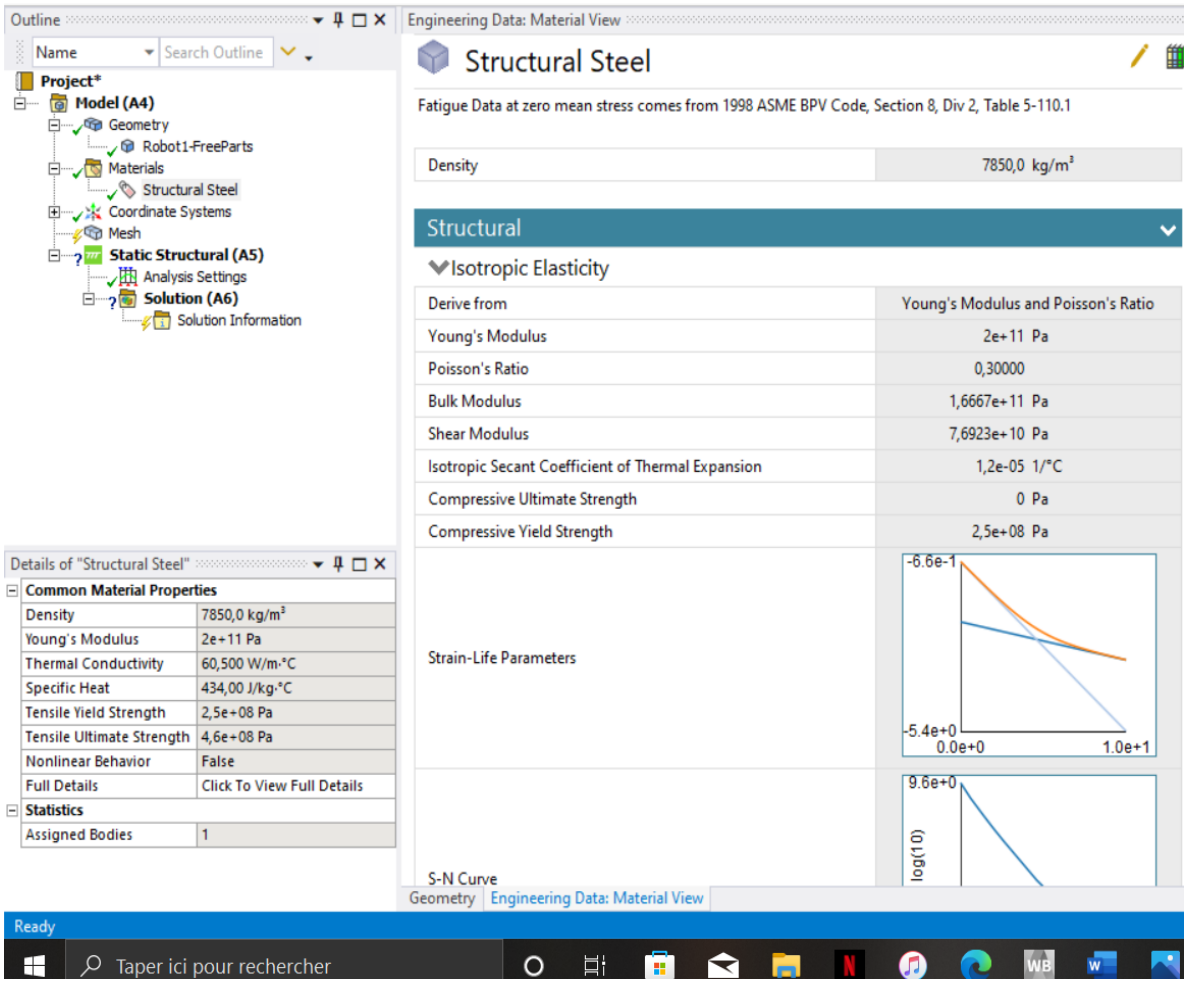
Details of "Robot1-FreeParts"

Coordinate System	Default Coordinate System
Reference Temperature	By Environment
Treatment	None
Material	
Assignment	Structural Steel
Nonlinear Effects	Yes
Thermal Strain Effects	Yes
Bounding Box	
Length X	1,342 m
Length Y	0,41 m
Length Z	1,1446 m
Properties	
Statistics	

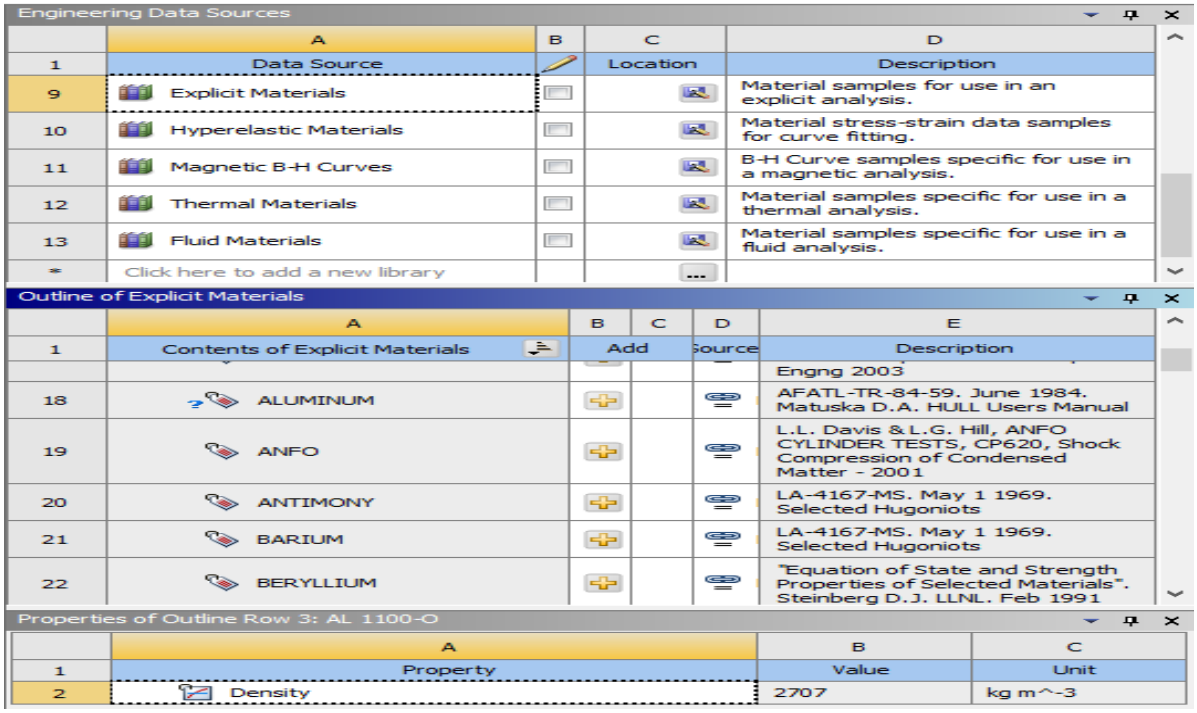


H = 1,342 m

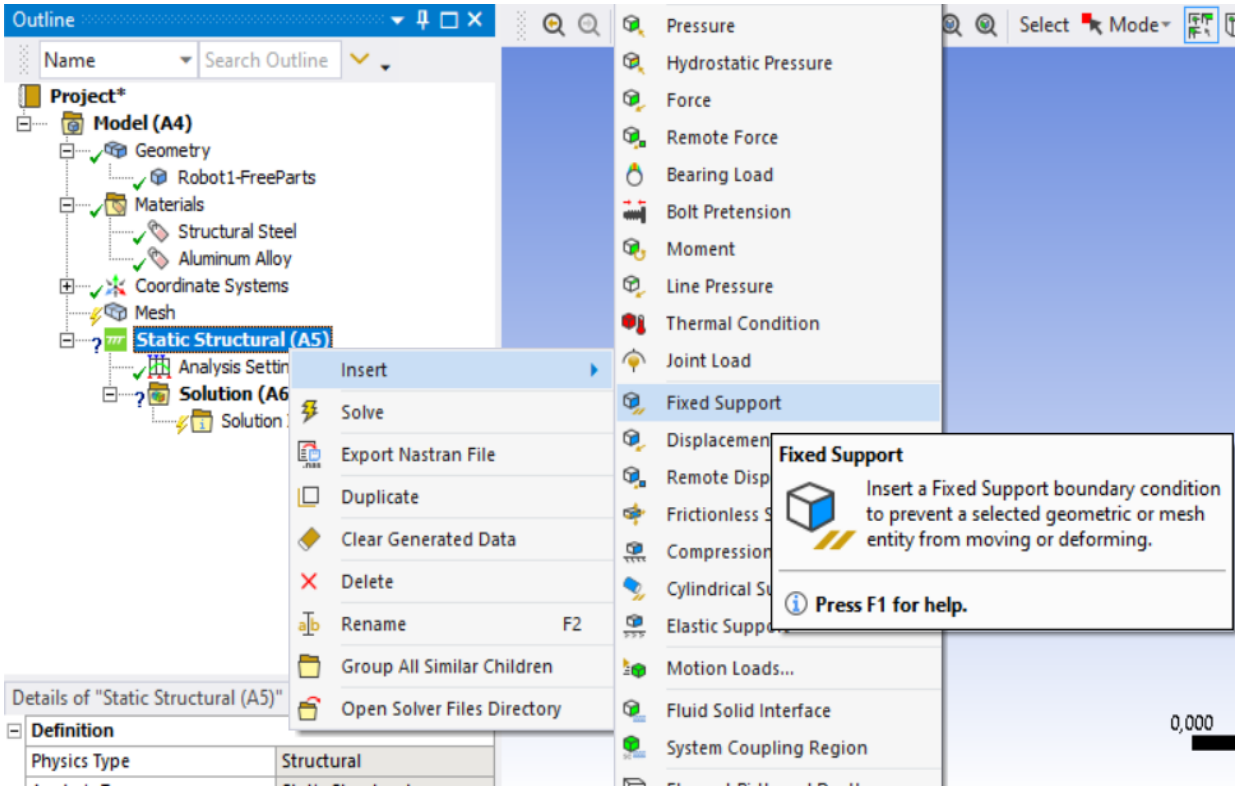
Verification of structural steel:

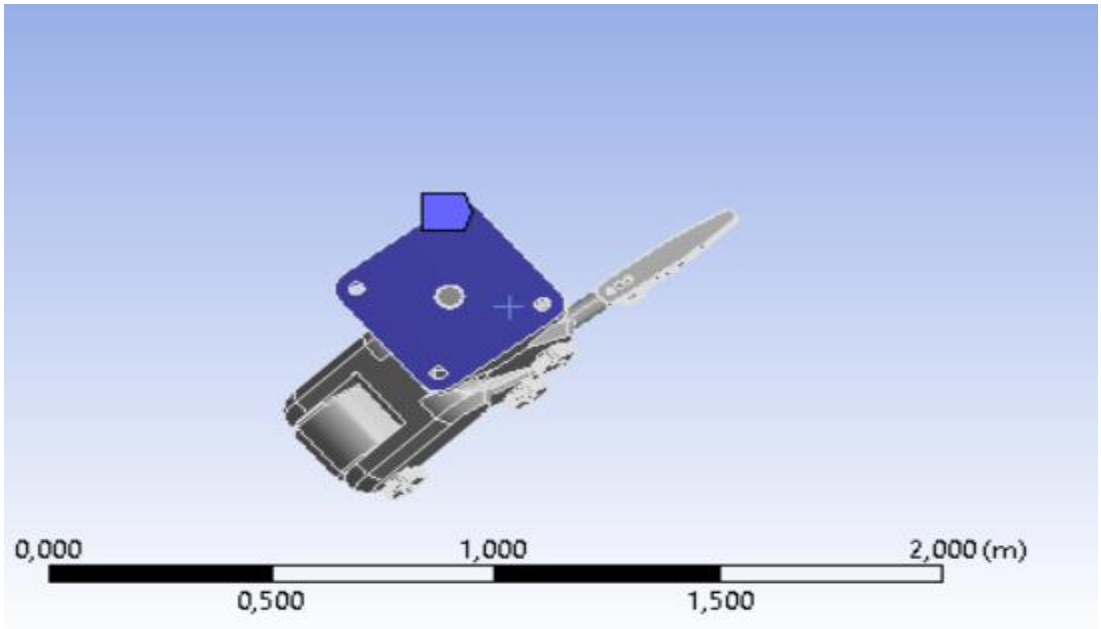


Adding the aluminum



Mass Calculation :





Force Isertion :