



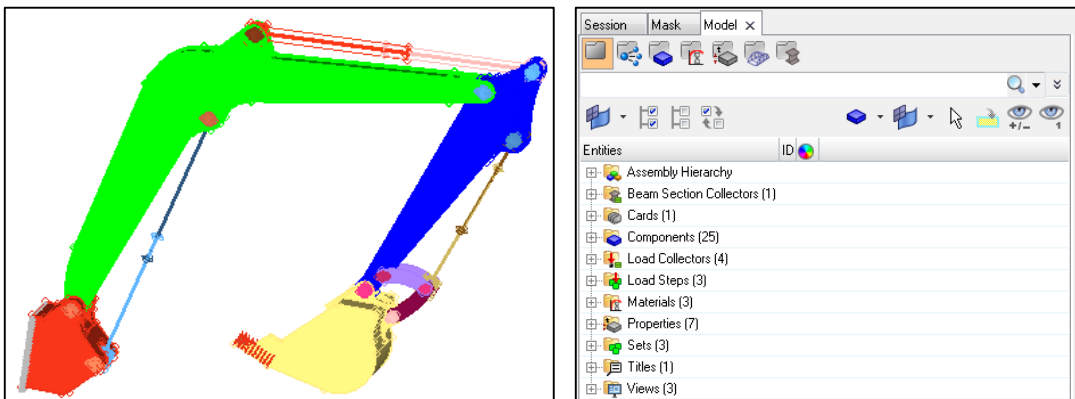
# Basic Interaction with HyperMesh Desktop

## Exercise 1a - Interacting With HyperMesh Desktop

This exercise will cover many of the basic concepts that are central to many of the features in HyperMesh Desktop. By the end of this exercise you should be familiar with the basic features of the HyperMesh Desktop software.

### Step 1: Set the User Profile and retrieve the model file, 01a-GUI.hm

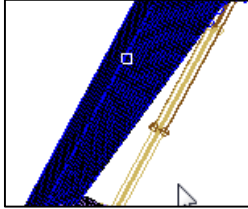
1. From the menu bar, select **Preferences > User Profiles** or select the  icon.
2. Select the **OptiStruct** user profile.
3. Click **OK**.
4. Select **File > Open > Model** from the menu bar or select the  icon.
5. Select the file 01a-GUI.hm.
6. Click **Open**.



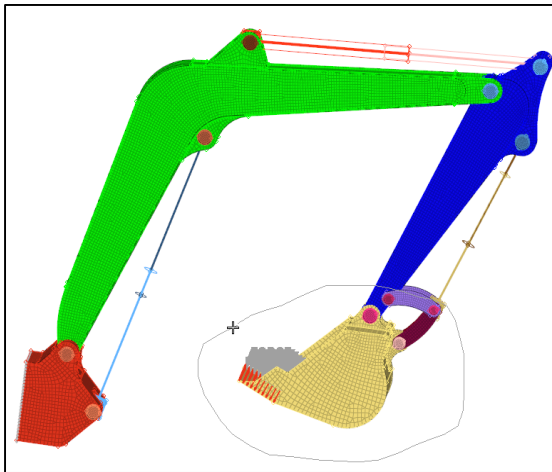
### Step 2: Rotate, Pan and Zoom the model

1. Hold down the Ctrl key
2. Click the Left Mouse button. (Note the small square in the center of the screen indicating the rotational center).

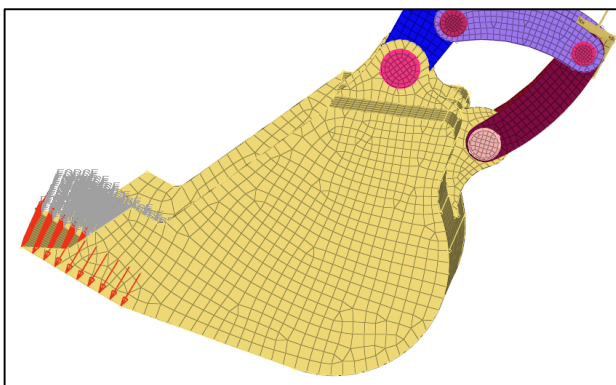
3. While holding both the Ctrl Key and Left Mouse Button, drag your mouse around to rotate the model.
4. While holding the Ctrl Key, click Left Mouse Button near a node (Note the small square moves to the node selected and becomes the new center of rotation). Continue to rotate the model.



5. While holding the Ctrl Key and the Right Mouse Button, drag your mouse around to pan the model.
6. While holding the Ctrl Key, click the Center Mouse Button (or clickable scroll wheel) and draw a circle around a portion of the screen.




7. This will zoom into the region surrounded by the drawn circle.

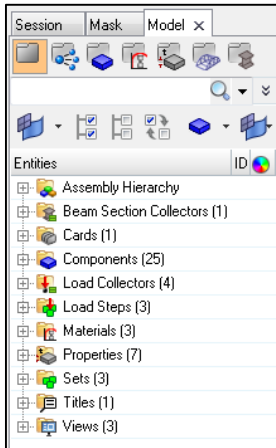


8. While holding the Ctrl Key, rotate the scroll wheel forward to Zoom Out and backward to Zoom In.
9. While holding the Ctrl Key, click the middle mouse button/scroll wheel to “fit” the model to the screen.



### Step 3: Use the Model Browser to control visualization

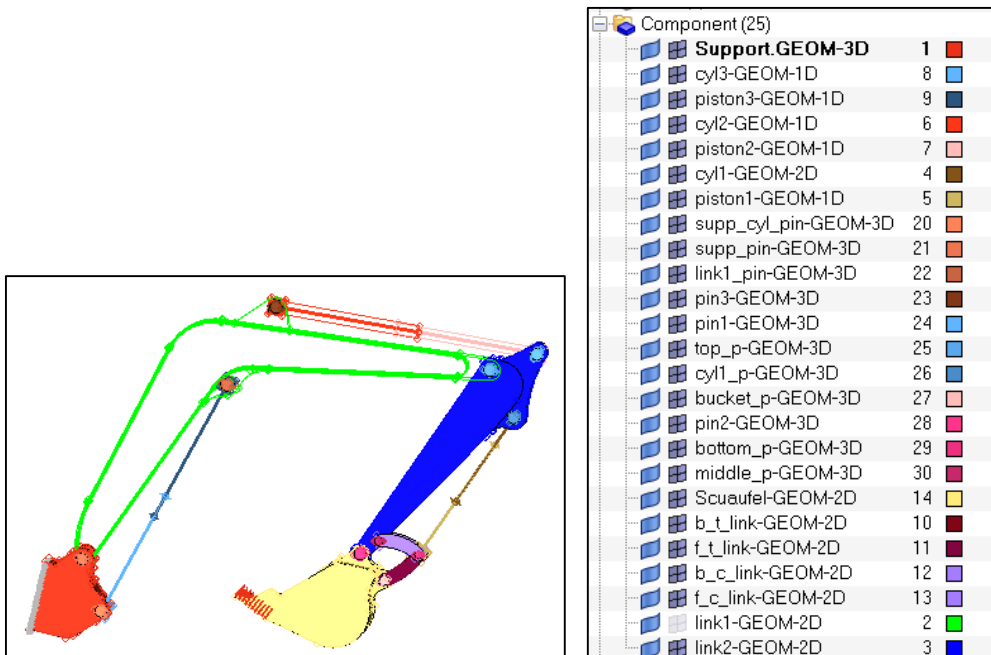
1. Press **F** on the keyboard to “fit” the model to the screen. If it does not work, click in the graphics window and then press **F**.


2. Make sure the **Model Browser tab > Model View** icon  is active.




3. Expand the **Component** category by clicking the **+** close to it. This will list all of the components in the model.

4. Using the **Geometry**  and **Elements**  icons, turn on and off components.




Using the **Show/Hide** Button  turn off and on components in the graphics window. Right click to hide a component and left click in the area of a hidden component to see a ghost image of the hidden component. Releasing the button reveals the component.

5. Using the **Isolate Button** , left click on a component in the graphics window to isolate it (turn off all other components) and right click on a hidden component to see a ghost image of the hidden component. Releasing the button isolates the selected component.

6. Use the global controls  to turn on, off and reverse all of the components.

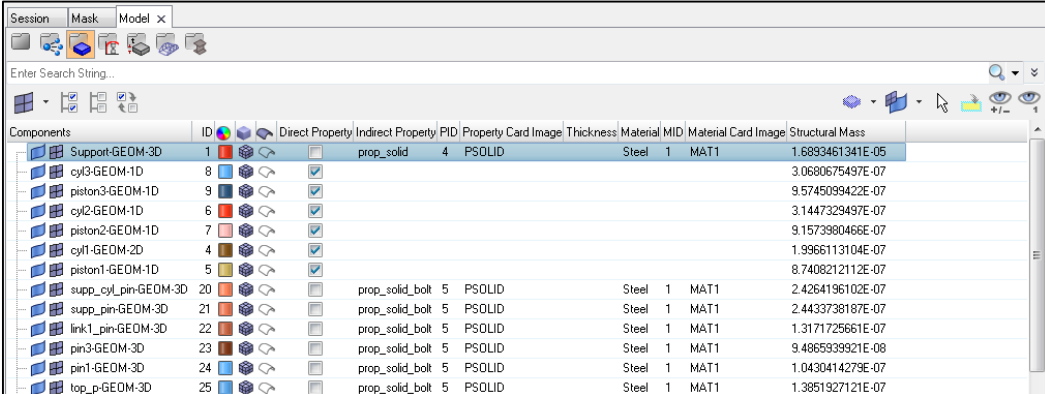
7. Highlight components using the Left Mouse Button in the Graphics Area, and note how the Global Controls now only affect the highlighted components.

8. Use the icon () to switch the global controls between the Geometry, Elements and Both options.

9. Review the other **Model Browser Views**:

a.  **Component View**

This view is highly useful when working solely with components as none of the other collectors are shown in the view. This view contains all of the visibility control and right click functions of the **Model View**. Additionally, it adds fields that show the mesh and geometry shading as well as the property and material applied to each component.



Components	ID	Direct Property	Indirect Property	PID	Property Card Image	Thickness	Material MID	Material Card Image	Structural Mass	
Support-GEOM-3D	1									
cyl3-GEOM-1D	8			prop_solid	4	PSOLID	Steel	1	MAT1	1.6893461341E-05
piston3-GEOM-1D	9								3.0680675497E-07	
cyl2-GEOM-1D	6								9.5745099422E-07	
piston2-GEOM-1D	7								3.1447323497E-07	
cyl1-GEOM-2D	4								9.1573980466E-07	
piston1-GEOM-1D	5								1.9966113104E-07	
supp_cyl_pin-GEOM-3D	20			prop_solid_bolt	5	PSOLID	Steel	1	MAT1	2.4264196102E-07
supp_pin-GEOM-3D	21			prop_solid_bolt	5	PSOLID	Steel	1	MAT1	2.4433738187E-07
link1_pin-GEOM-3D	22			prop_solid_bolt	5	PSOLID	Steel	1	MAT1	1.3171725661E-07
pin3-GEOM-3D	23			prop_solid_bolt	5	PSOLID	Steel	1	MAT1	9.4865939921E-08
pin1-GEOM-3D	24			prop_solid_bolt	5	PSOLID	Steel	1	MAT1	1.0430414279E-07
top_p-GEOM-3D	25			prop_solid_bolt	5	PSOLID	Steel	1	MAT1	1.3851927121E-07

b.  **Property View**

This view allows the user to view all of the properties in the model and the color of the entities on the screen by their assigned property. The visibility controls as well as all right click extended functionality, work with this view as well.

Properties	ID	Include	Defined	Type	Card Image	Thickness	MID	Material Type	Material
prop_1D_cylinder	6	0	<input checked="" type="checkbox"/>	1D PBEAM			2	ISOTROPIC	Steel_S355J2H
prop_1D_piston	7	0	<input checked="" type="checkbox"/>	1D PBEAM			2	ISOTROPIC	Steel_S355J2H
prop_t0100	2	0	<input checked="" type="checkbox"/>	2D PSHELL	1.0		1	ISOTROPIC	Steel
prop_t0050	1	0	<input checked="" type="checkbox"/>	2D PSHELL	0.5		1	ISOTROPIC	Steel
prop_solid	4	0	<input checked="" type="checkbox"/>	3D PSOLID			1	ISOTROPIC	Steel
prop_solid_bolt	5	0	<input checked="" type="checkbox"/>	3D PSOLID			1	ISOTROPIC	Steel
prop_t0170	3	0	<input checked="" type="checkbox"/>	2D PSHELL	1.7		1	ISOTROPIC	Steel

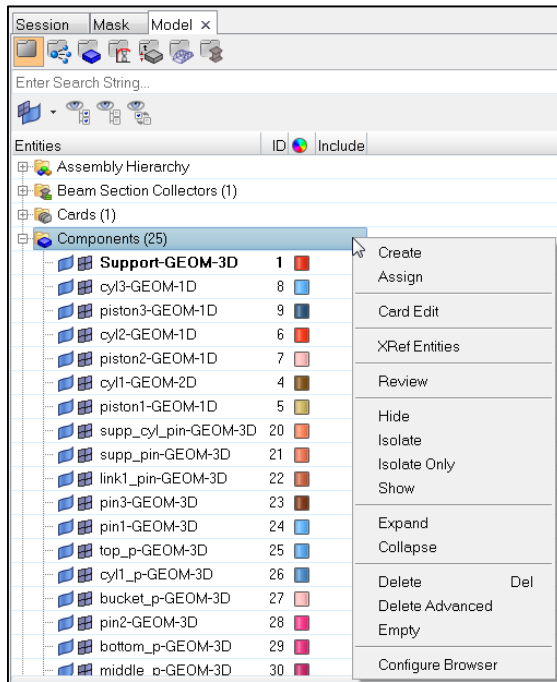
c.  **Material View**

This view allows the user to view all of the materials in the model and the color of the entities on the screen by their assigned material. The visibility controls as well as all right click extended functionality, work with this view as well.

Materials	ID	Include	Defined	Type	Card Image
Steel_S355J2H	2	0	<input checked="" type="checkbox"/>	ISOTROPIC	MAT1
Steel	1	0	<input checked="" type="checkbox"/>	ISOTROPIC	MAT1
mat8	3	0	<input checked="" type="checkbox"/>	ORTHOTROPIC	MAT8

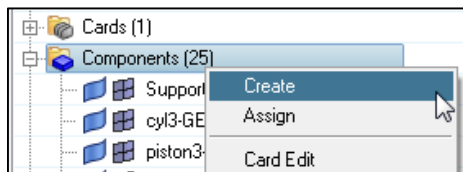
10. **Context-Sensitive Menu** - You can change a variety of options by right-clicking on a folder or entity in the browser's tree display. Options you specify in empty space around the model apply to the entire model.

11. Right click on the **Component** folder will open the following context menu.



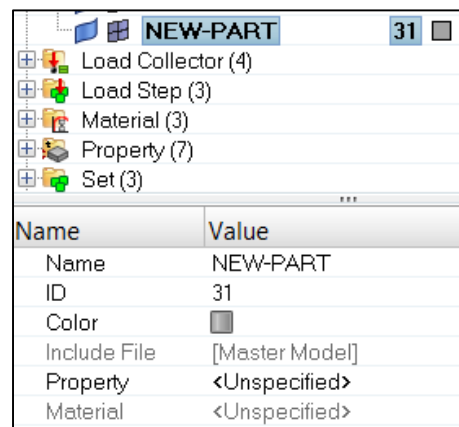
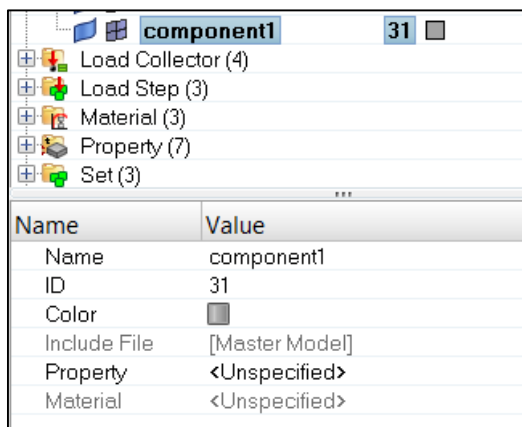
Try the following functions:

- a. **Create** a new component:

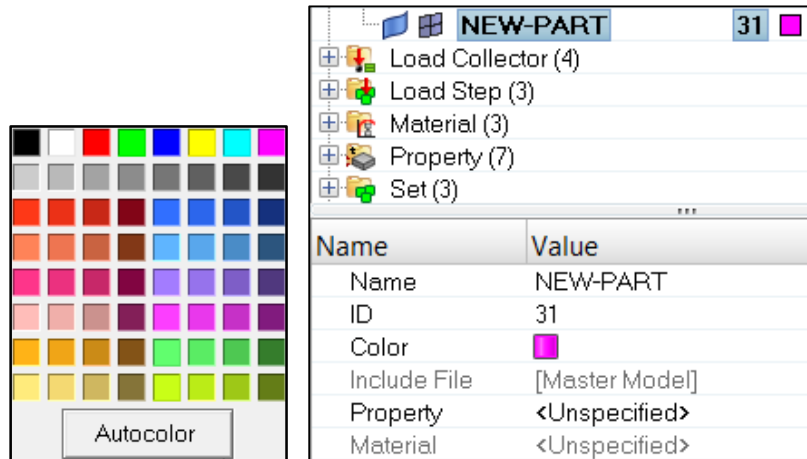


- b. **Rename** a component:

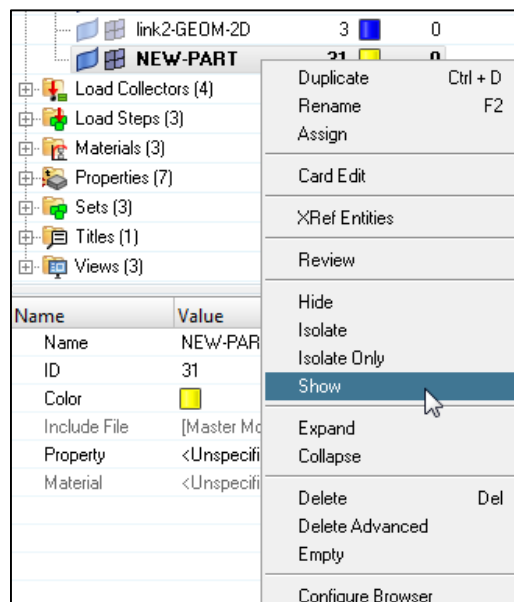
Click Right Mouse Button on **component1** and select **Rename** or Left Click on the new component "**component1**" will open below the **Entity Editor** tab area, where you can change component name in the **Value** field.



- c. Change and choose the component color by clicking the **Color** Value field.

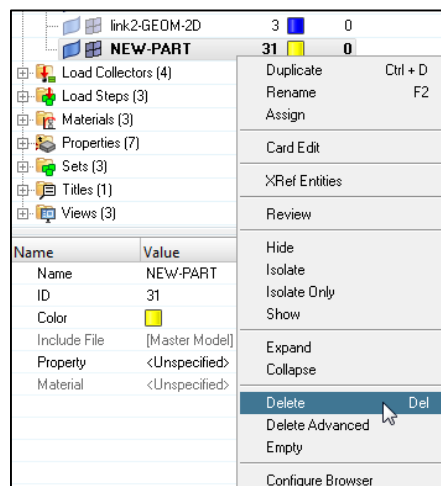


d. **Show/Hide & Isolate a component:**



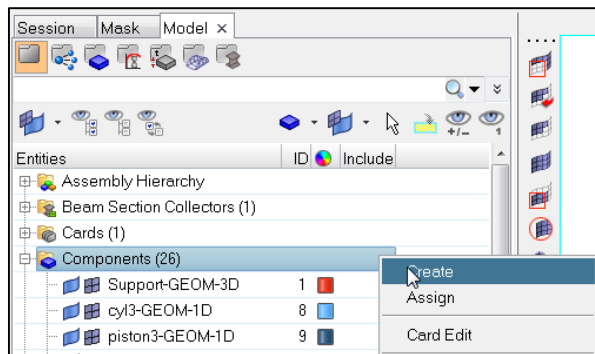
e. **Isolate Only a component** (see if you can figure out the difference between **Isolate** and **Isolate Only**).

f. **Delete a component:**

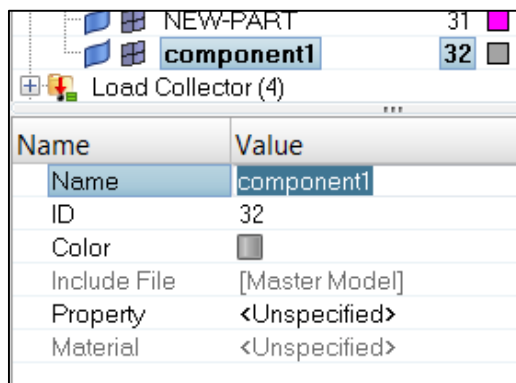


## Step 4: Working with Collectors

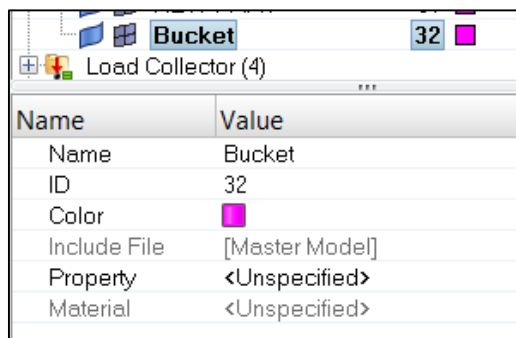
1. Right click on the **Model tab > Model View > Component** folder will open the following context menu, select **Create**.



2. Left Click on the new component “**component1**” will open below the **Entity Editor** tab area, where you can change component name in the **Value** field.



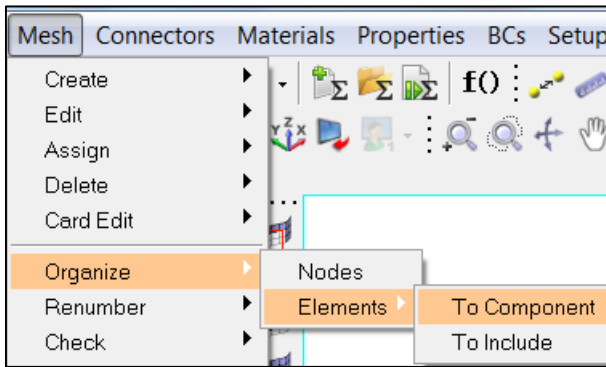
3. In the **Entity Editor**, name it “**Bucket**” and select a **color**.




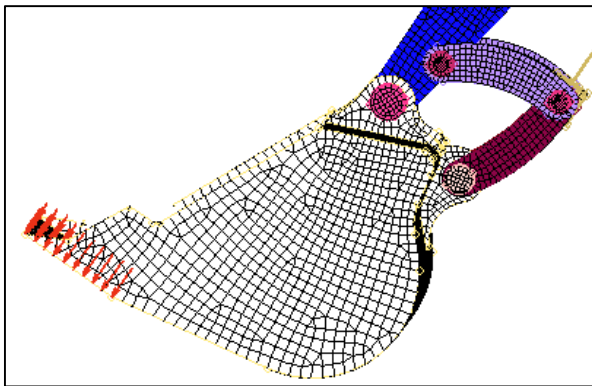
The new collector has been created and now we will move the elements for the bucket into this new collector.


4. From the menu bar select **Mesh > Organize > Elements > To Component** or select the icon .





- In the **Model Browser** click the **Selector** icon . This allows you to pick components from the graphics window.
- Click the bucket in the graphics window (component “**Schaufel-GEOM-2D**”).

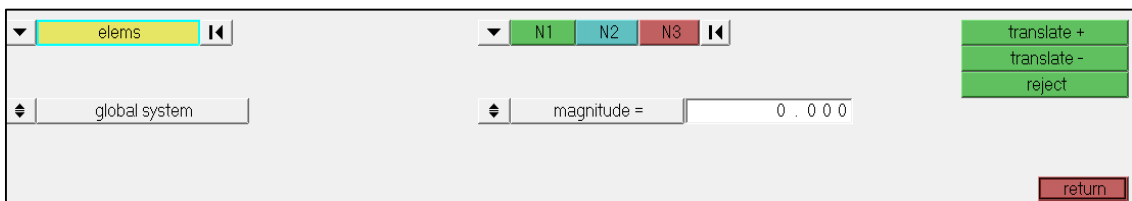


- Click the **Add To Panel Collector** icon . This will add the selected elements, included in “**Schaufel-GEOM-2D**” component, to the selection.
- Click the **dest component=** button and select the newly created “**Bucket**” component.
- Click **move** and the elements in the collector will be moved to the new component.

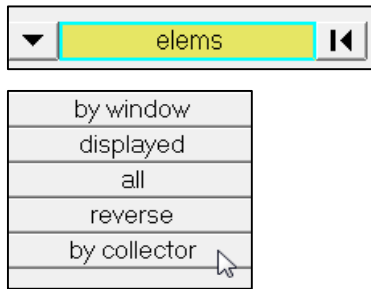
### Step 5: Use of Panels and Directional Functions

This step will introduce the user to commonly used functions in panels as well as the use of the directional definition tools found in many HyperMesh panels.

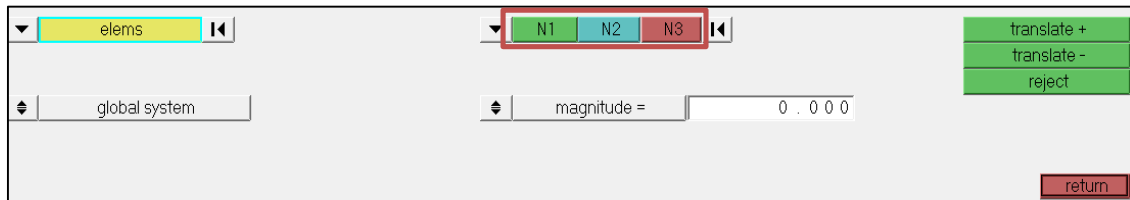
- Locate the item in the **menu** bar that allows you to Translate Elements (**Mesh > Translate > Elements**).




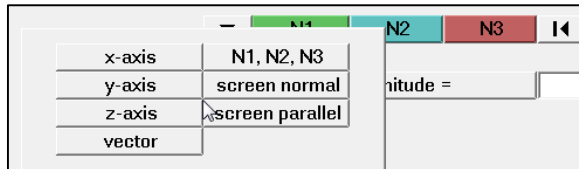
- Select the elements included in the component “**Support-GEOM-3D**”.



3. Keep direction option **N1, N2, N3**.

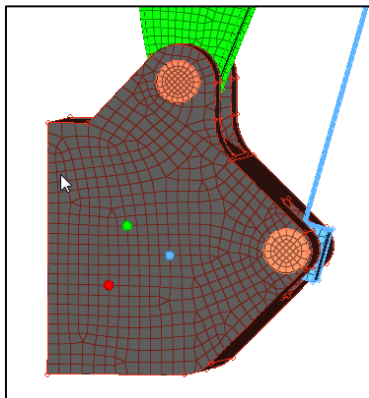


If you want to change the direction options, you have to click  and select the direction:



**x, y and z axis** will translate along those cardinal axis, while **N1,N2,N3** allows the user to define a direction as a vector (N1->N2) or as a normal to a plane defined by the points N1,N2 and N3 following the right hand rule.

4. Pick a node on the flat face of the “**Support-GEOM-3D**” component shown below. A green dot will appear at the selected node showing that N1 has been defined there. The blue focus square will automatically move to N2.

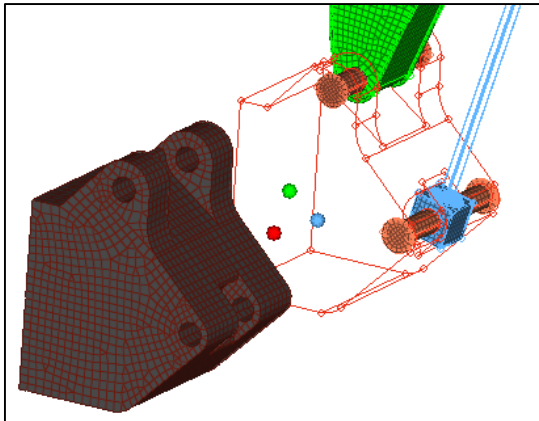


5. Continue in a Clockwise direction picking two more nodes on the face defining the blue N2 and red N3 nodes. Your model should look like similar to the picture above.

**NOTE:** It is not necessary that your nodes be identical to the image, just similar.

6. Enter 30 in the **magnitude=** field.
7. Click **translate -**.

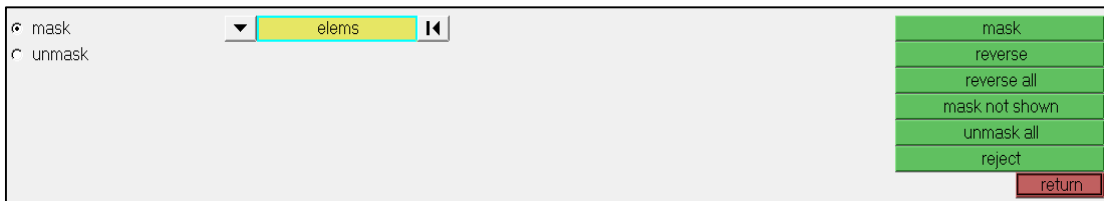
The entire component will move 30 model units in the negative direction defined by the normal of the plane N1, N2 and N3.



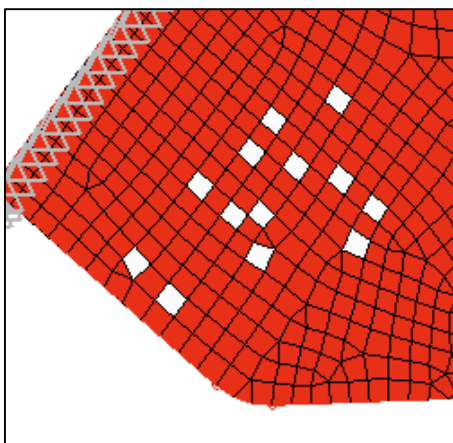
8. Click **reject**.
9. Try moving the component in other directions using both cardinal axis and the N1, N2 and N3 options.
10. Try moving the component using only N1 and N2 and then change the **magnitude=** field to **N2-N1** and see what that option works.
11. Use the **reject** button and the opposite direction translation to bring your component back to the previous location.

### Step 6: Using the Mask Function and Selecting Entities

1. Using the **Mask Icon**  from the **Display** toolbar to enter the **Mask** panel.

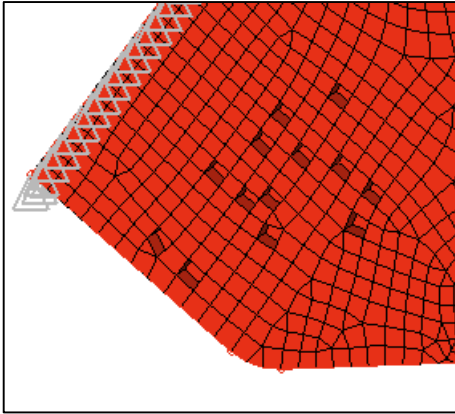


2. Change the entity selection to **elems**.
3. Pick a number of elements on the screen.



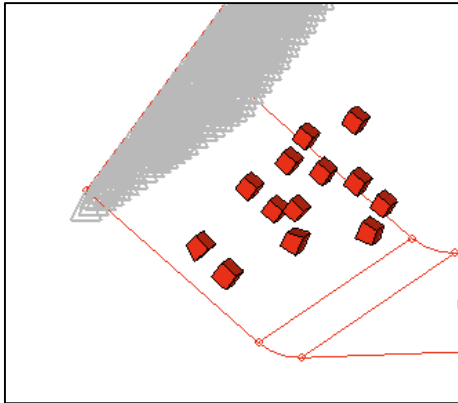
4. Click **mask**.

This will hide the elements from view but they still can be affected through other panels.



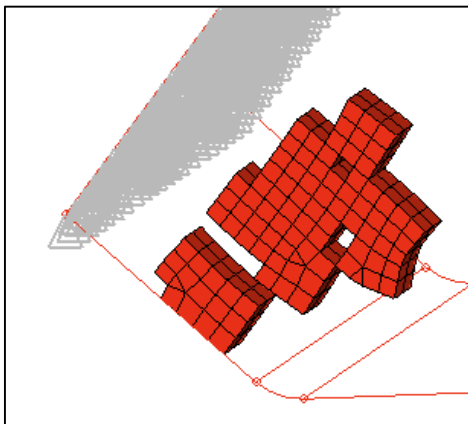
5. Click the **Reverse** Icon .


This will Unmask the hidden elements and will mask all the elements previously shown.



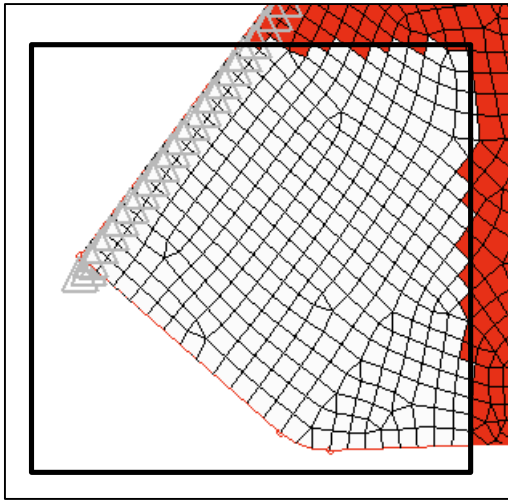
6. Click the **Unmask Adjacent** Icon .

This will unmask elements immediately adjacent to those on the screen. This can be done repeatedly.



7. Click the **Unmask All** Icon  to bring everything into view.  
8. Click the **Mask** Icon again.

9. Hold the Shift Key down and holding the Left Mouse Button, drag a box in the graphics window to box select elements.



10. Hold the Shift Key down and holding the Right Mouse Button, drag a box in the graphics window to de-select elements.

11. Click the yellow **elems** button to open the extended selection window.

by window	on plane	by width	by geoms	by domains	by laminate
displayed	retrieve	by group	by adjacent	by handles	by path
all	save	duplicate	by attached	by morph vols	by include
reverse	by id	by config	by face	by block	
by collector	by assems	by sets	by outputblock	by ply	

12. Experiment with options, including the following:

- **displayed** – Selects entities currently displayed on the screen
- **all** – Selects ALL entities in the model, displayed or not.
- **reverse** – After selecting a few elements this will “reverse” the selection.
- **by collector** – Displays a list of collectors and entities can be selected by the collector they are in.
- **by geoms** – By choosing either surfs or solids, elements can be selected by picking the geometry that they were created from. Useful in that a single geometry selection can select many elements.
- **save/retrieve** – Saving a selection places those entities into a 1 slot “user mark” that can be retrieved again and again in selections until it is overwritten.

