

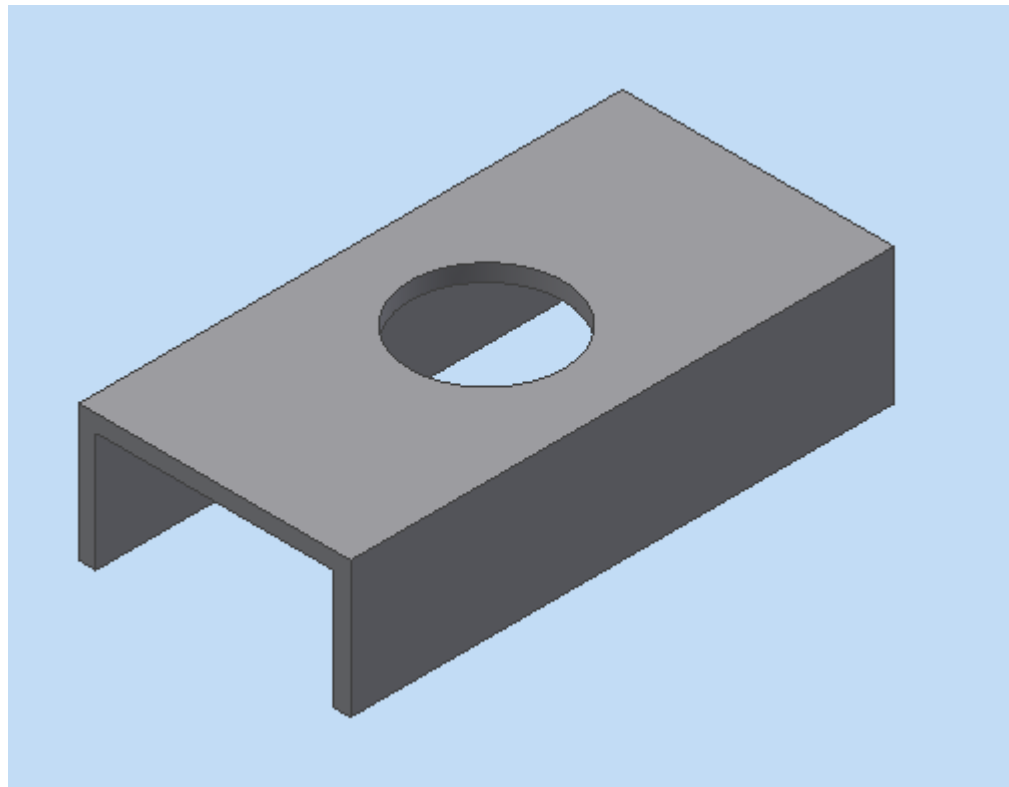
CAD - Parts

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Homework check

C-Channel

- Why?
- Process: Model -> Drawing -> Real part

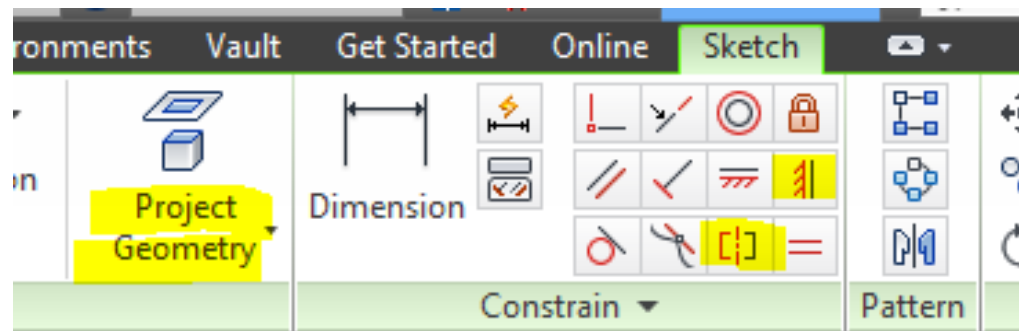
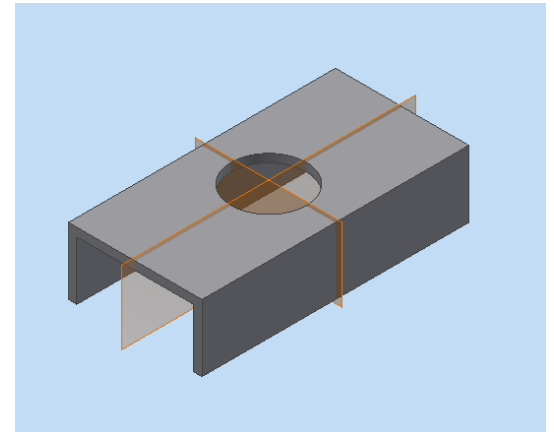


Setup

- Make sure you are on the right project
 - new project file
- New > (under part) Standard.ipt > Create
- Save the file

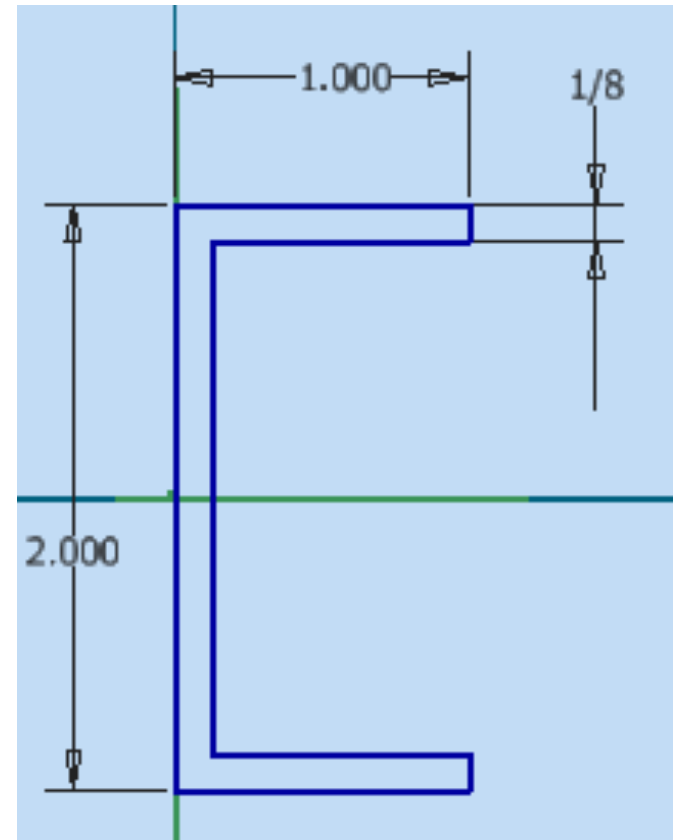
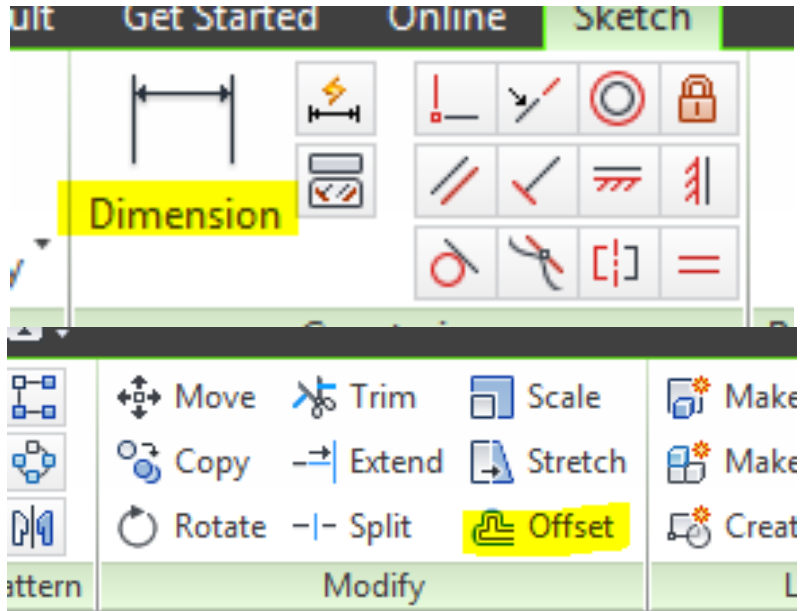
2D Sketch

- 2D sketch > origin > XY plane
- project geometry > X & Y Axis
- make a 'C' shape
- Constraints
 - symmetric
 - vertical
- show constrain - F8
- hide constrain - F9
- save



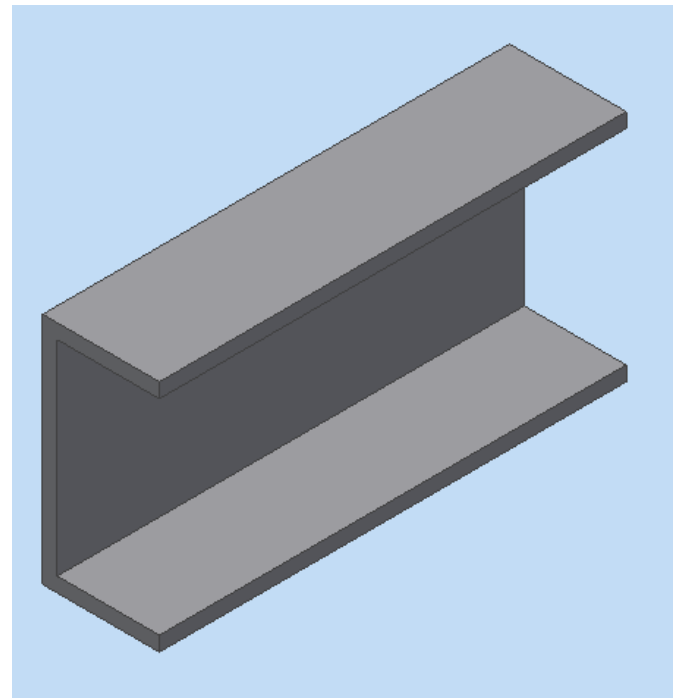
2D Sketch

- Dimensions
- Make thickness
- Formula in dimensions
- Save



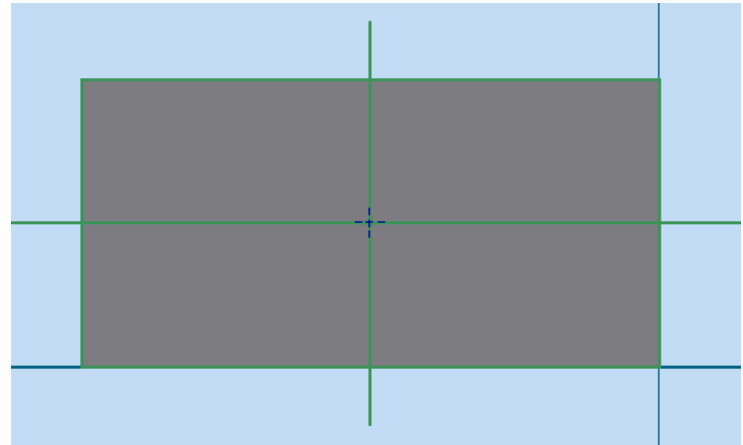
Make it 3D

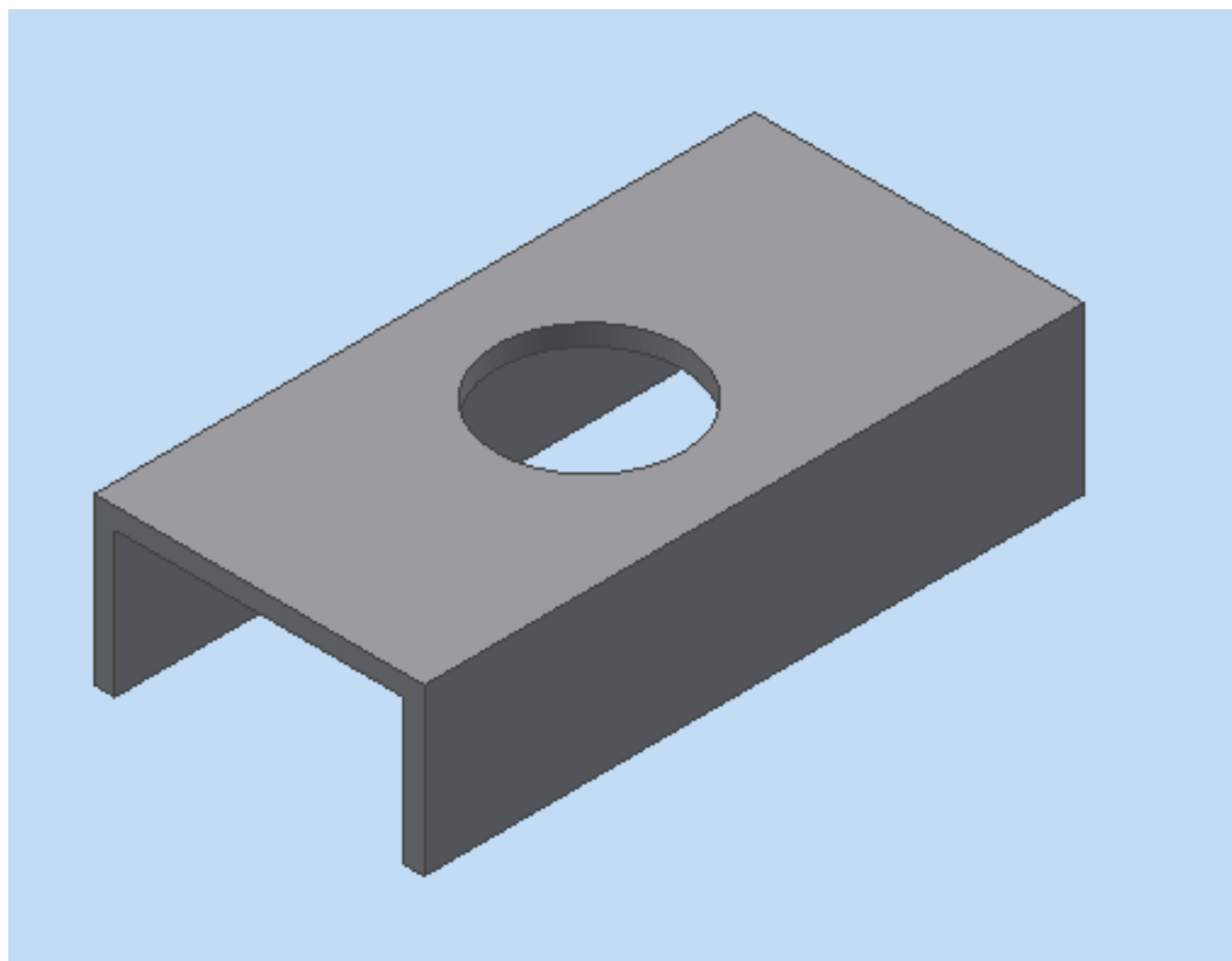
- quit sketch
- extrude
- extends both ways
- save



Add holes

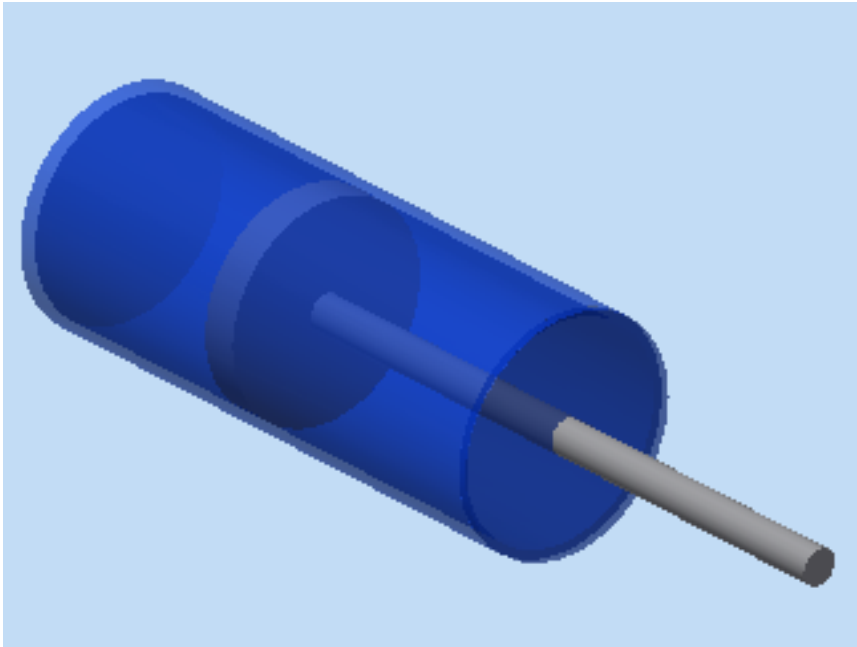
- create new sketch at the right plane
- see the center
- make hole
- name it
- save



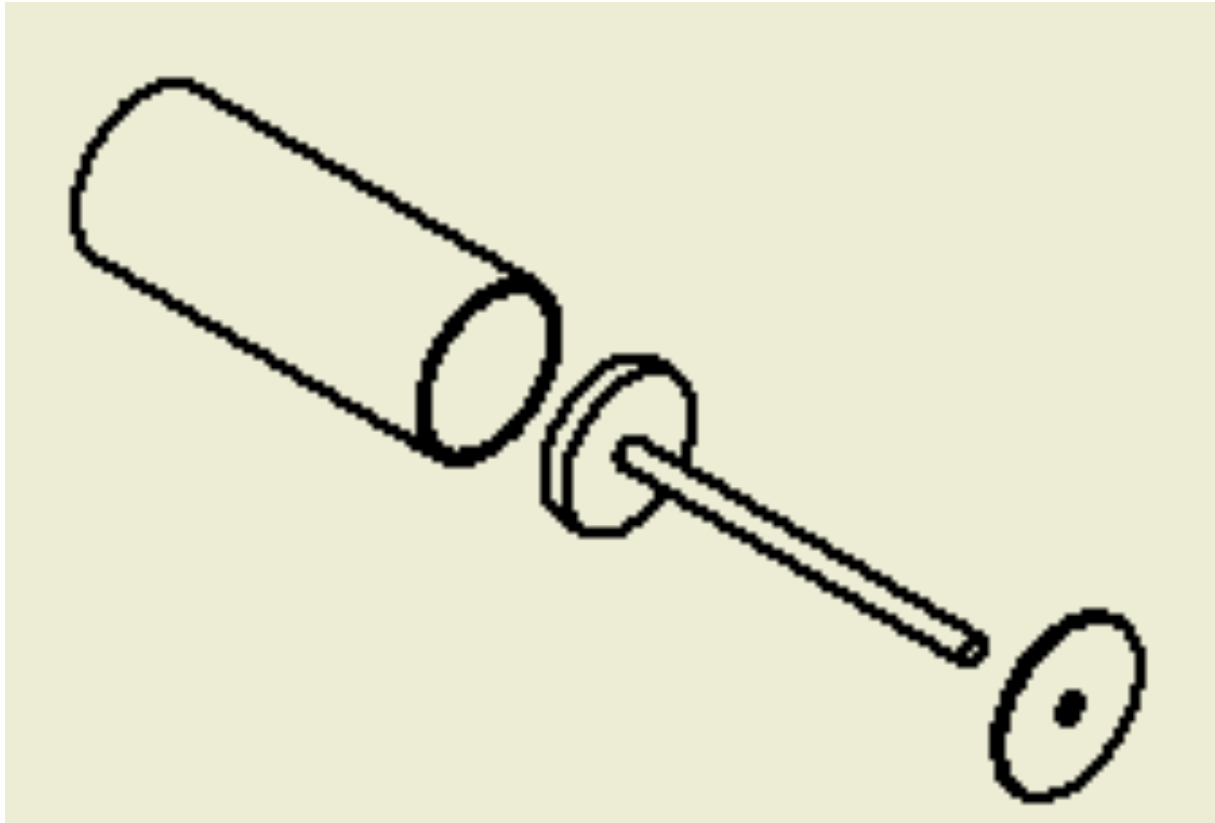


Pneumatic Actuator

- pneumatic demo
- model demo



The Actuator



Inventor Parameters

Parameters

Parameter Name	Unit	Equation	Nom	Tol.	Moc	Key	Comment
Model Parameters							
d0	in	cylinder_wallThickness	0...	0...	0...	<input type="checkbox"/>	
d3	in	cylinder_length	4...	4...	4...	<input type="checkbox"/>	
d4	in	bore_thickness	0...	0...	0...	<input type="checkbox"/>	
d5	in	shaft_dia	0...	0...	0...	<input type="checkbox"/>	
d7	in	cylinder_wallThickness	0...	0...	0...	<input type="checkbox"/>	
d8	in	bore_dia	1...	1...	1...	<input type="checkbox"/>	
d9	in	shaft_length	4...	4...	4...	<input type="checkbox"/>	
User Parameters							
cylinder_wallThickness	in	1 in / 16 ul	0...	0...	0...	<input checked="" type="checkbox"/>	
shaft_length	in	4 in	4...	4...	4...	<input checked="" type="checkbox"/>	
shaft_dia	in	1 in / 4 ul	0...	0...	0...	<input checked="" type="checkbox"/>	
cylinder_length	in	4 in	4...	4...	4...	<input checked="" type="checkbox"/>	
bore_dia	in	1.5 in	1...	1...	1...	<input checked="" type="checkbox"/>	
bore_thickness	in	1 in / 4 ul	0...	0...	0...	<input checked="" type="checkbox"/>	

▽ × F = - ∂B / ∂t

▽ × F = - ∂B / ∂t

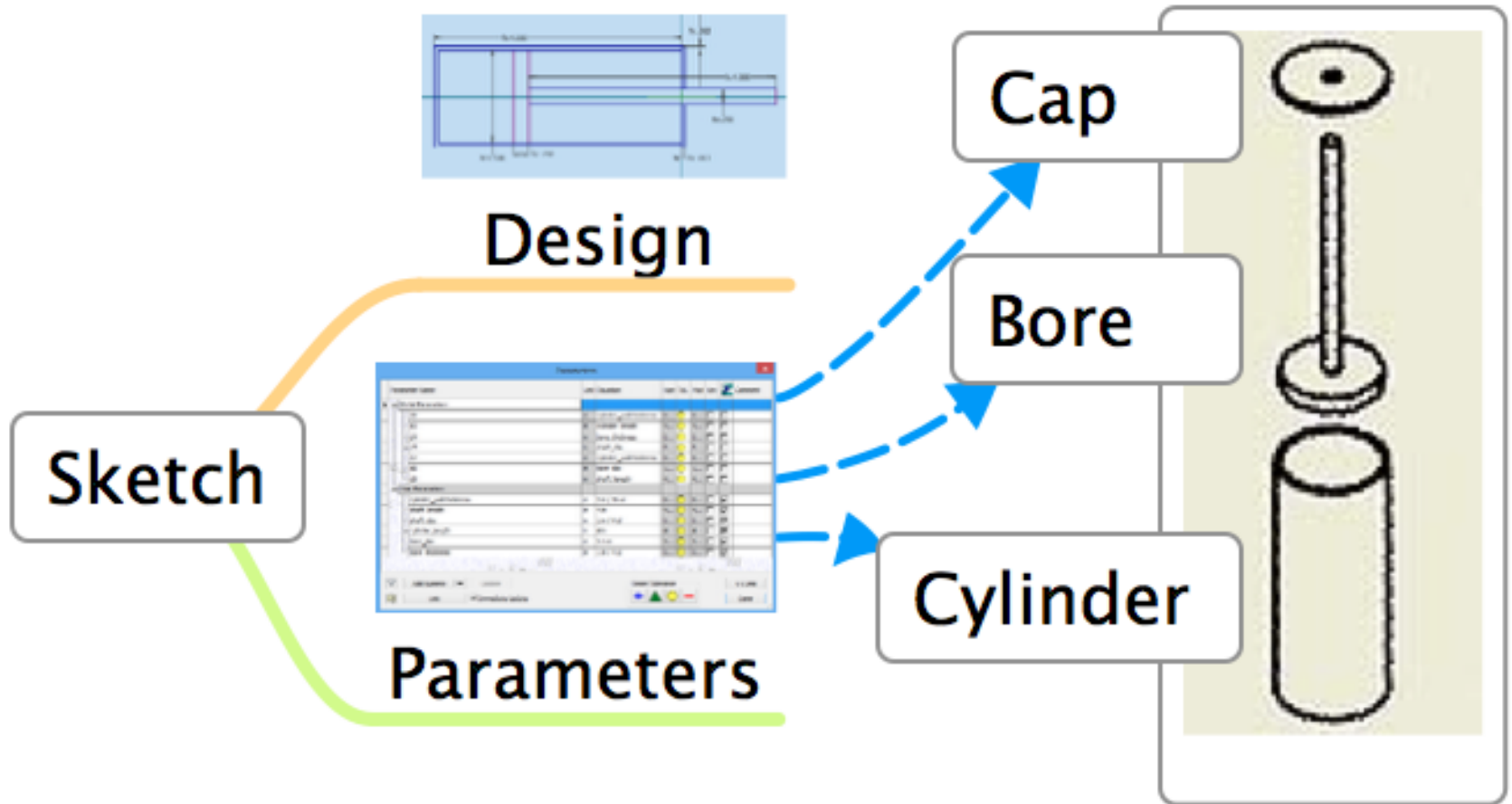
Filter: Add Numeric ▼ Update

Link ☒ Immediate Update

Reset Tolerance: +, ▲, ●, -

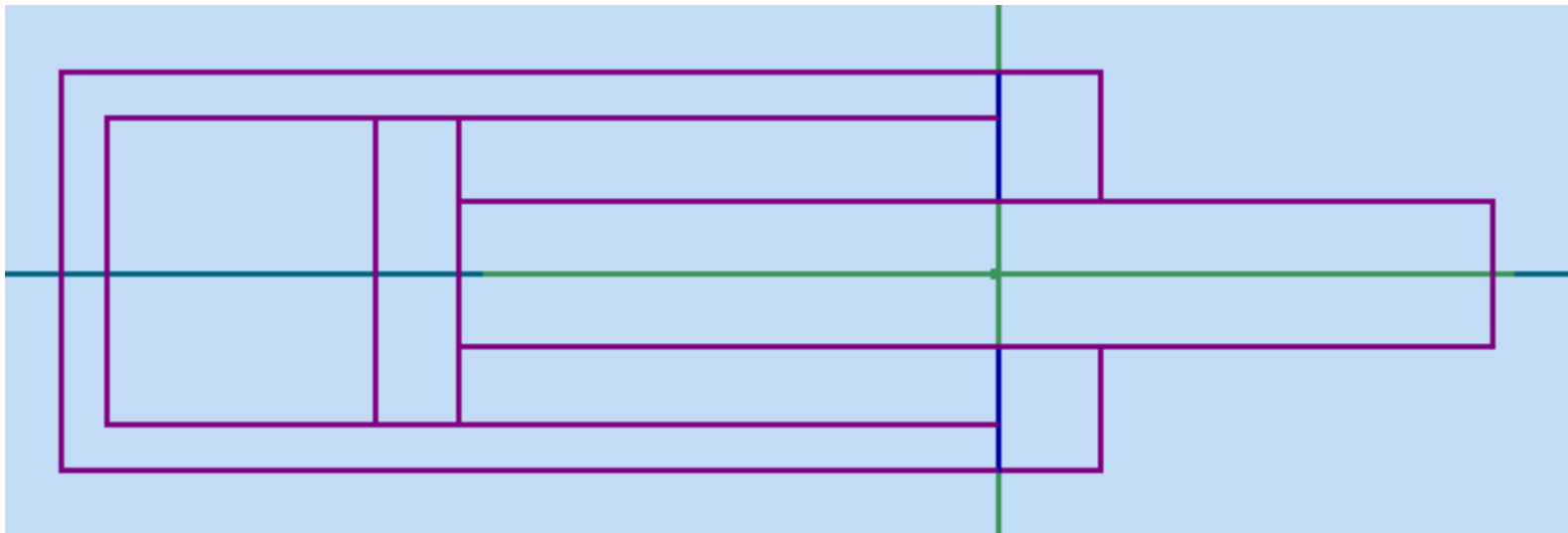
<< Less Done

Inventor Parameters



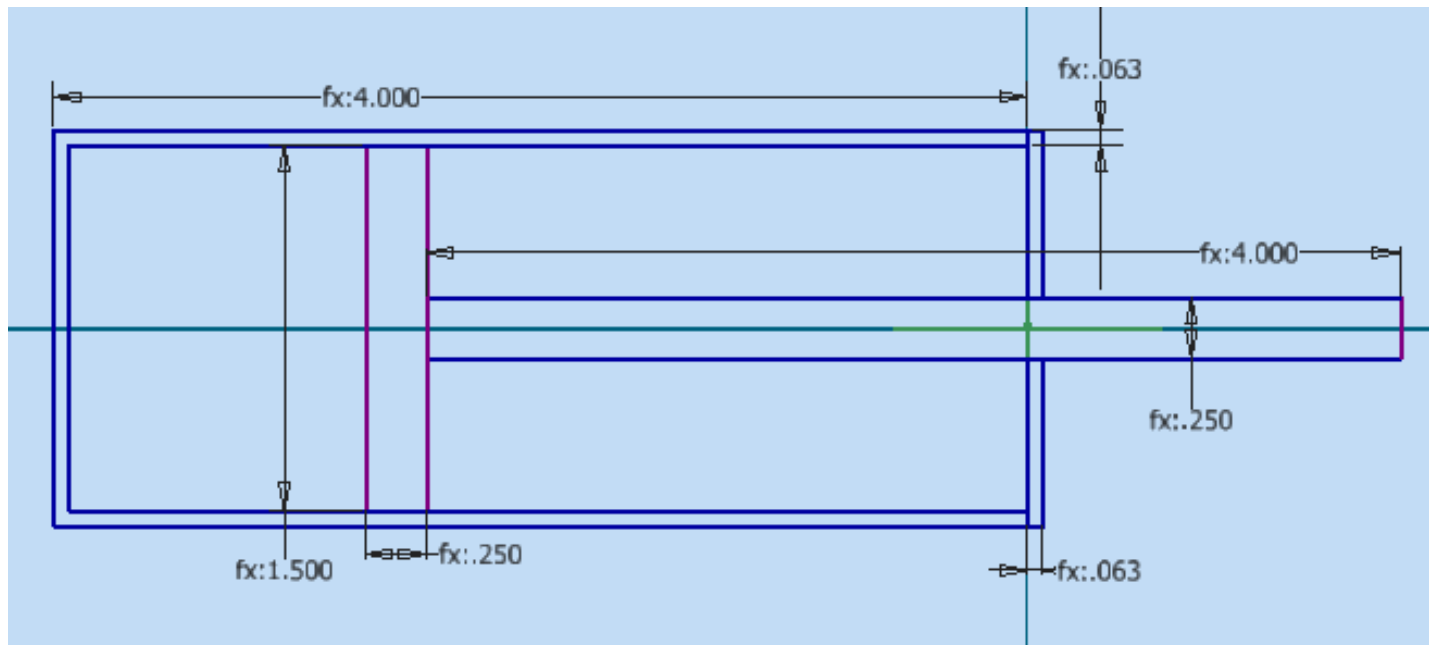
1. design the actuator using sketch

- Cylinder: like C-channel
- Bore: **make sure not to click the green dot
- Shaft: another rectangle
- Cap: 2 rectangle with vertical constraint



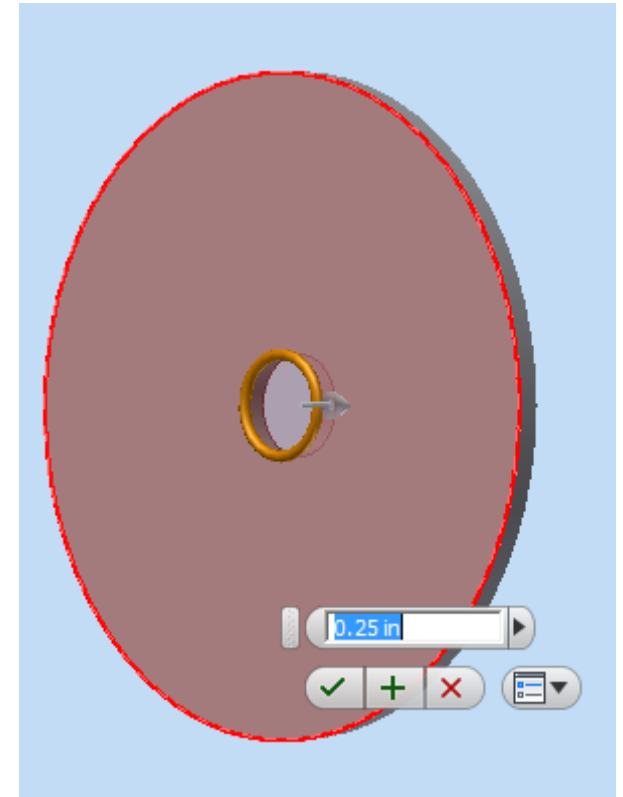
2. Add parameters

- add parameters to the table
- constraints with parameter
- change parameters & see it update



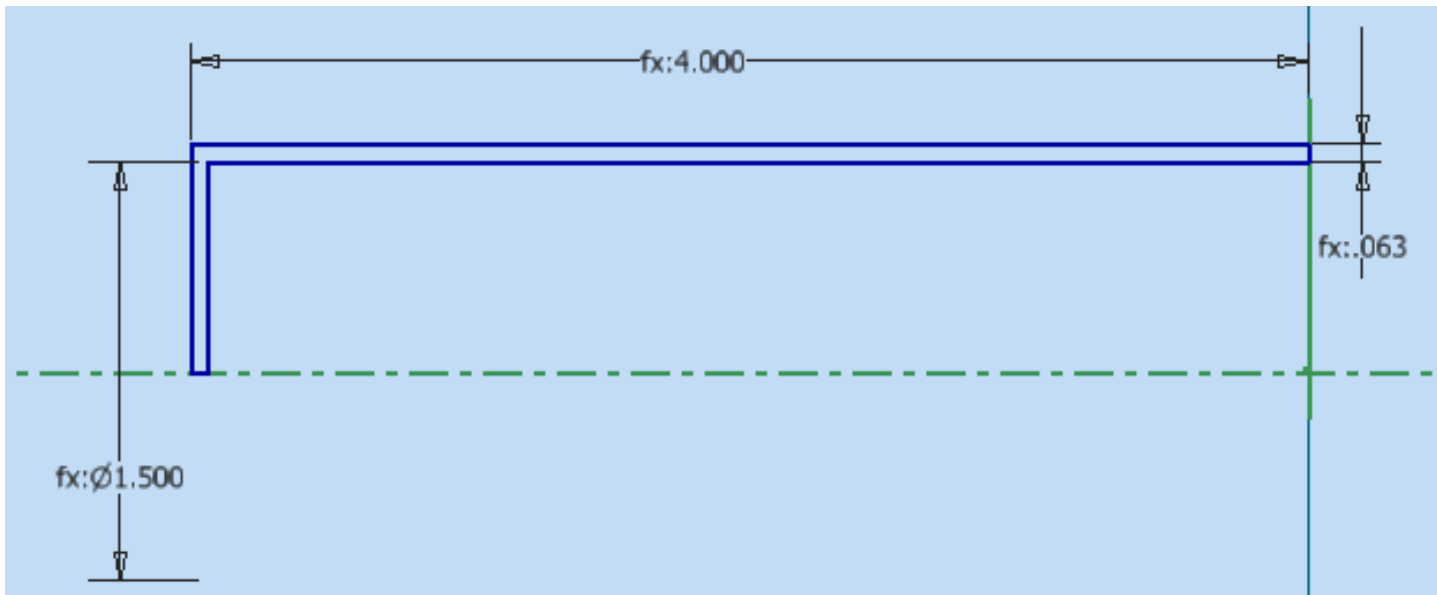
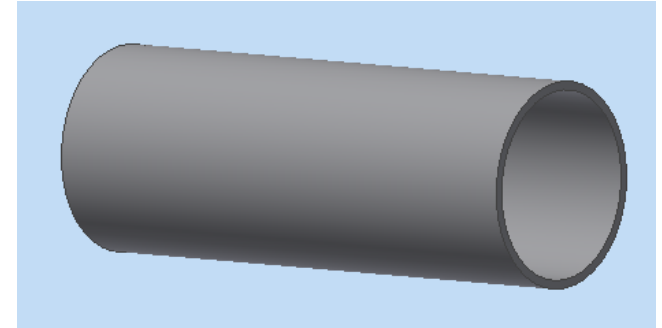
3-1. Make parts - Cap

- what plane to create sketch
- make circle
 - parameter & formula
- make hole
 - Concentric



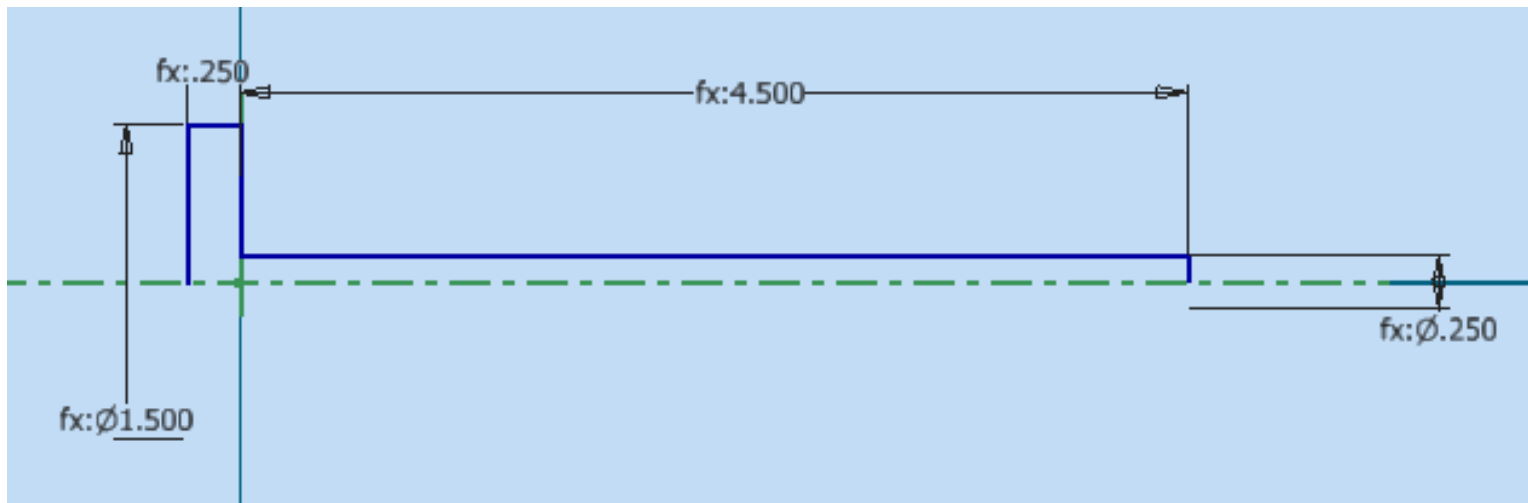
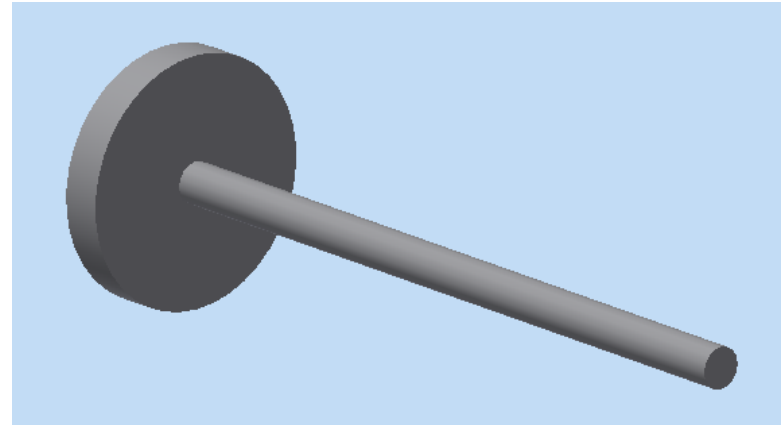
3-2. Make parts - Cylinder

- make half of the cut area
- centerline
- revolve



3-3. Make parts - Bore

- let's revolve again
- draw a half 'T' shape

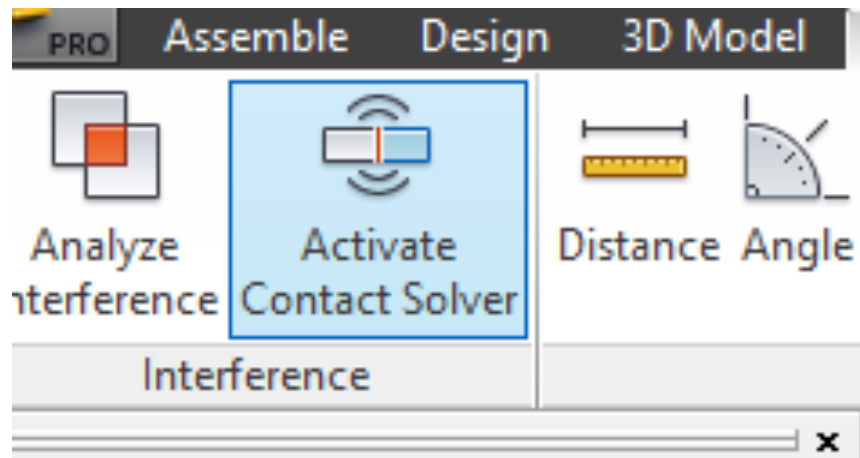


4. Put them together

- new assembly
- **place the cylinder first
- remember how to place constraint?
 - Mate for bore
 - Insert for the cap
- make the cylinder and cap invisible

5. FancyStuff++

- contact set
 - Inspect > Activate Contact Solver
 - right click on parts > Contact Set
- change parameters



Homework!

- 4-bar linkage
- LEGO
- Wheel

