FabLab
SINGAPORE POLYTECHNIC

EP1000

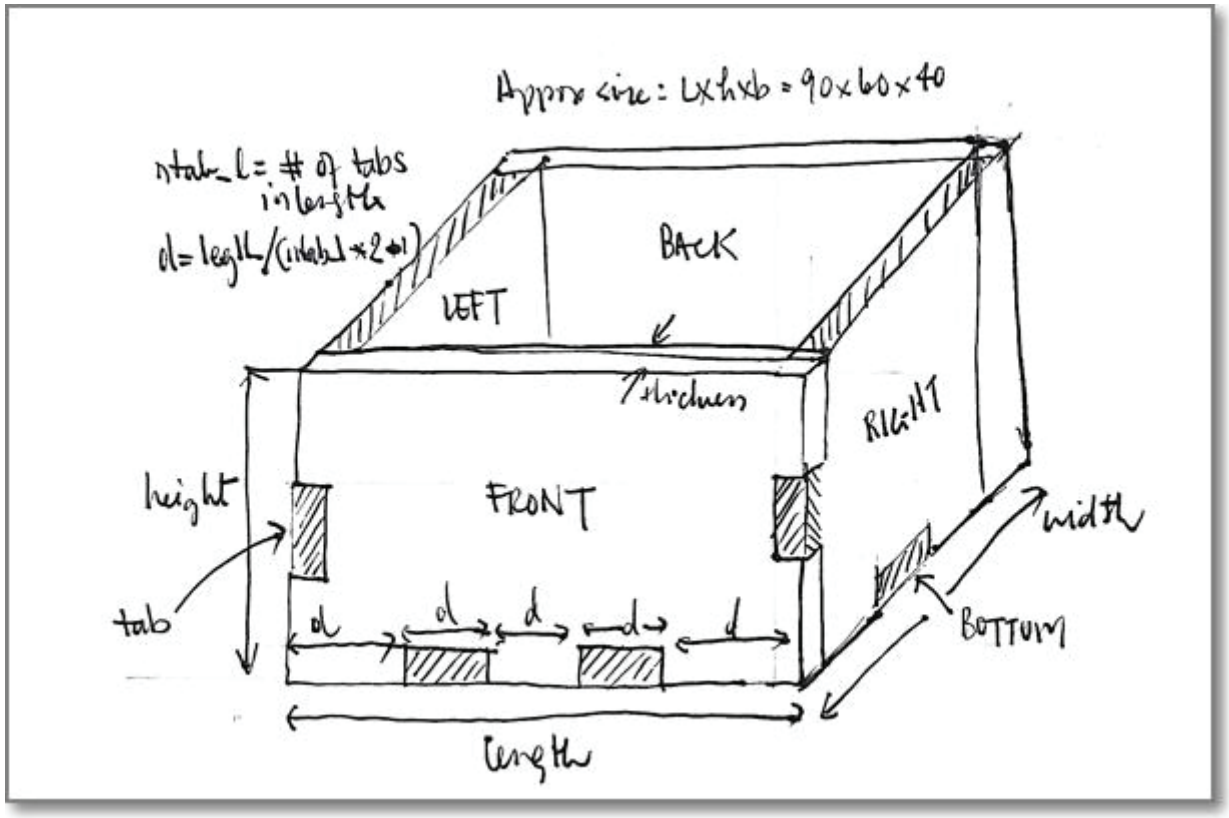
Computer Controlled Cutting 2

Lasercut Parametric Box

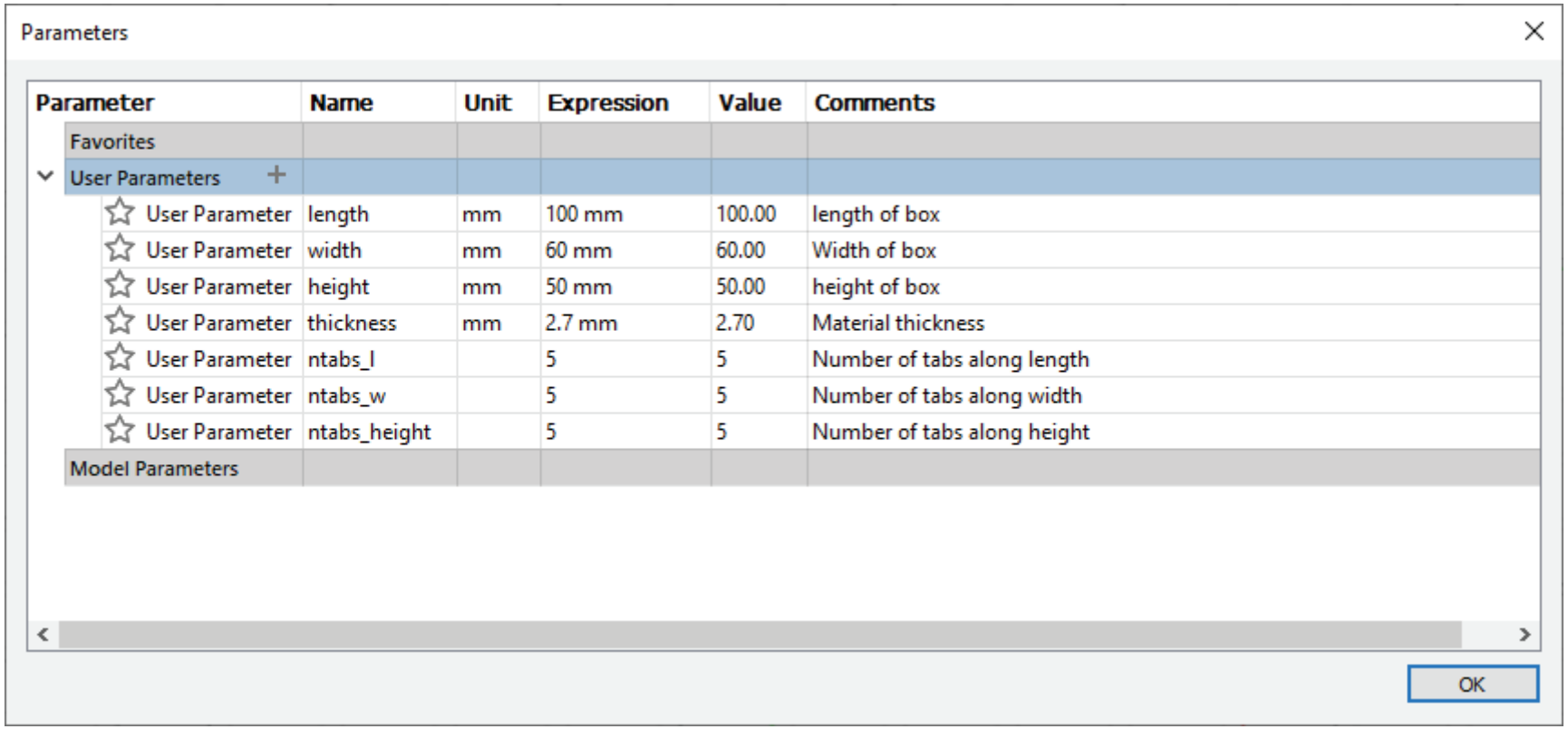
- Boxes are useful in all projects as they provide housing or containment.
- Making the box parametric allows changes, accommodating for boxes of different sizes, types.
- A practical example that can be used for other projects.

Start with a sketch

- Sketch on paper how your box looks like and the approximate dimensions.

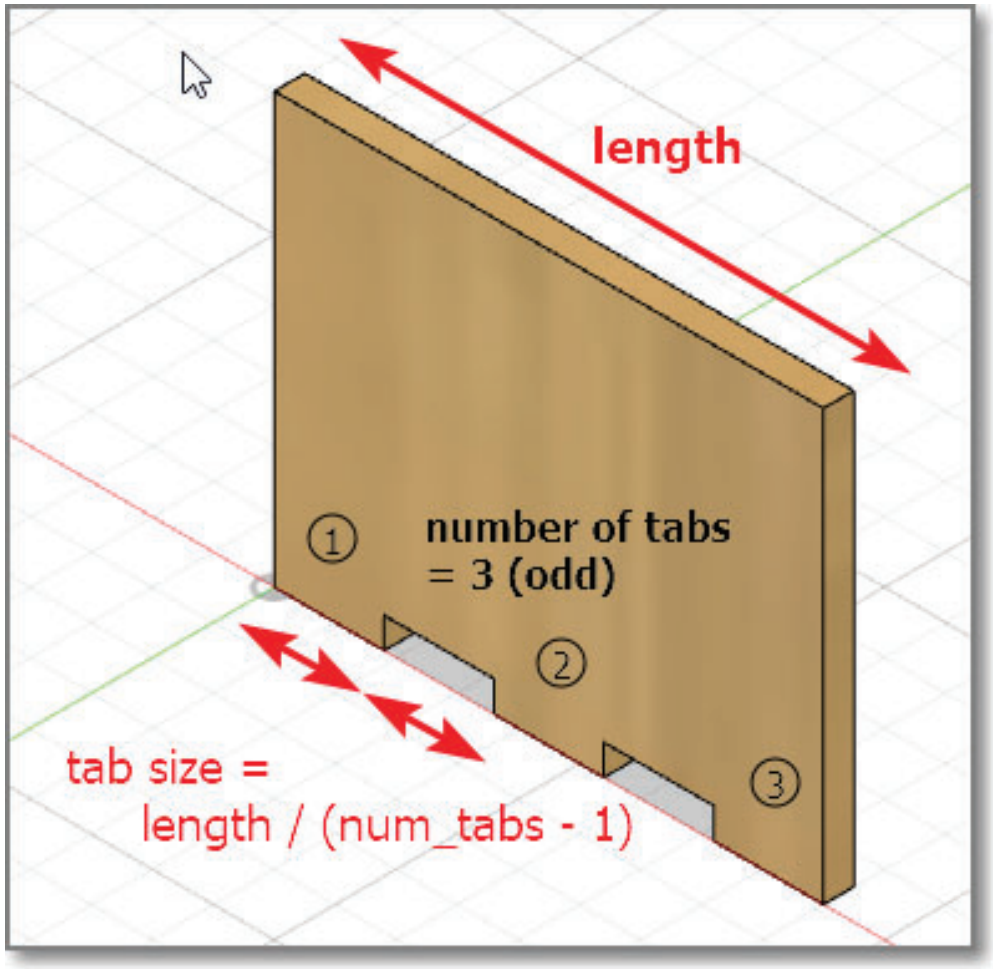


Define the parameters

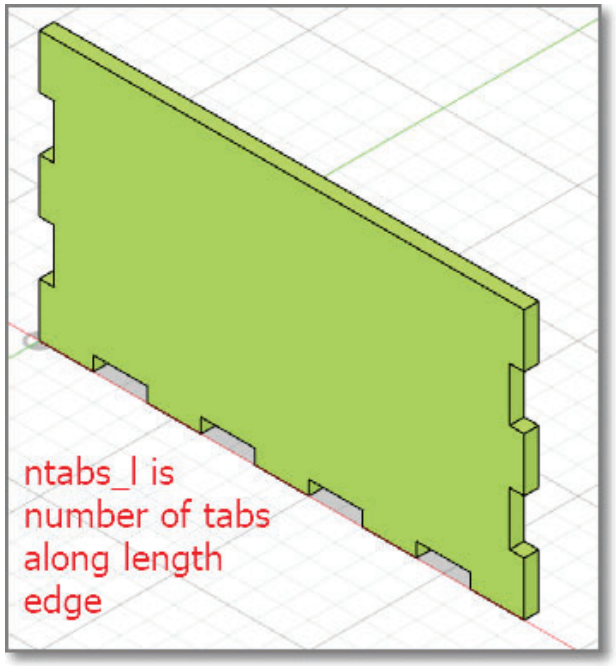


Basic Calculations

- Odd number of tabs
- Tabs and spacers have same size
- Do NOT use the sketch > rectangular pattern to duplicate.
- You CAN use the 3D create > pattern to duplicate the feature.

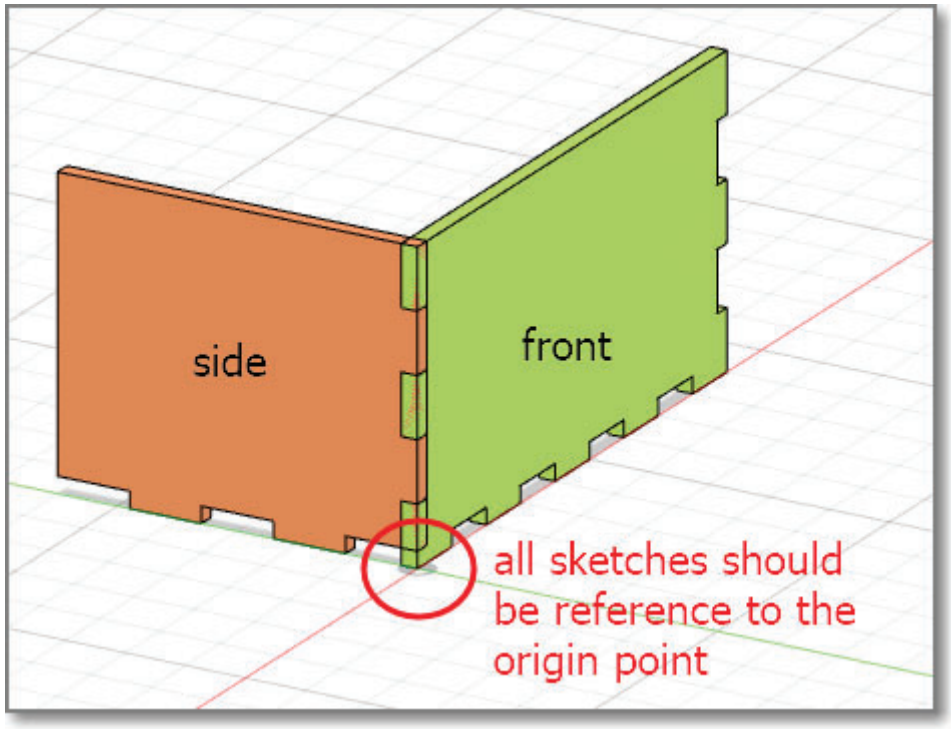


Create the front face



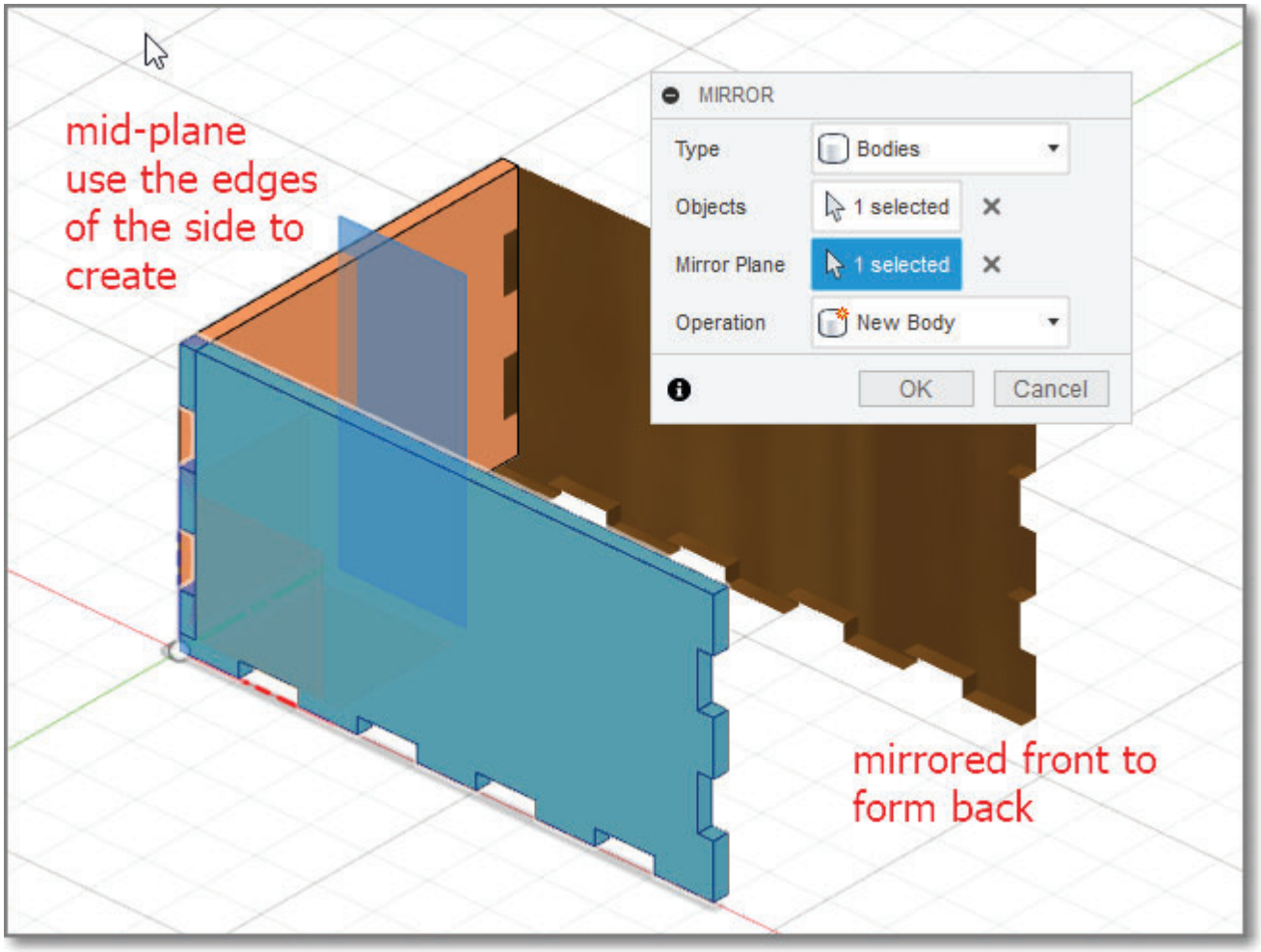
- Make a new component
- Sketch the face
  - Add the tabs
  - tabLength = length/ (ntabs_1*2-1)
- Extrude

Add the side component



- New component
- Create sketch
  - Start for ORIGIN
  - Choose **EDGE** face of front tab
  - Constrain sketch to the front component
  - Draw the tabs
- Extrude

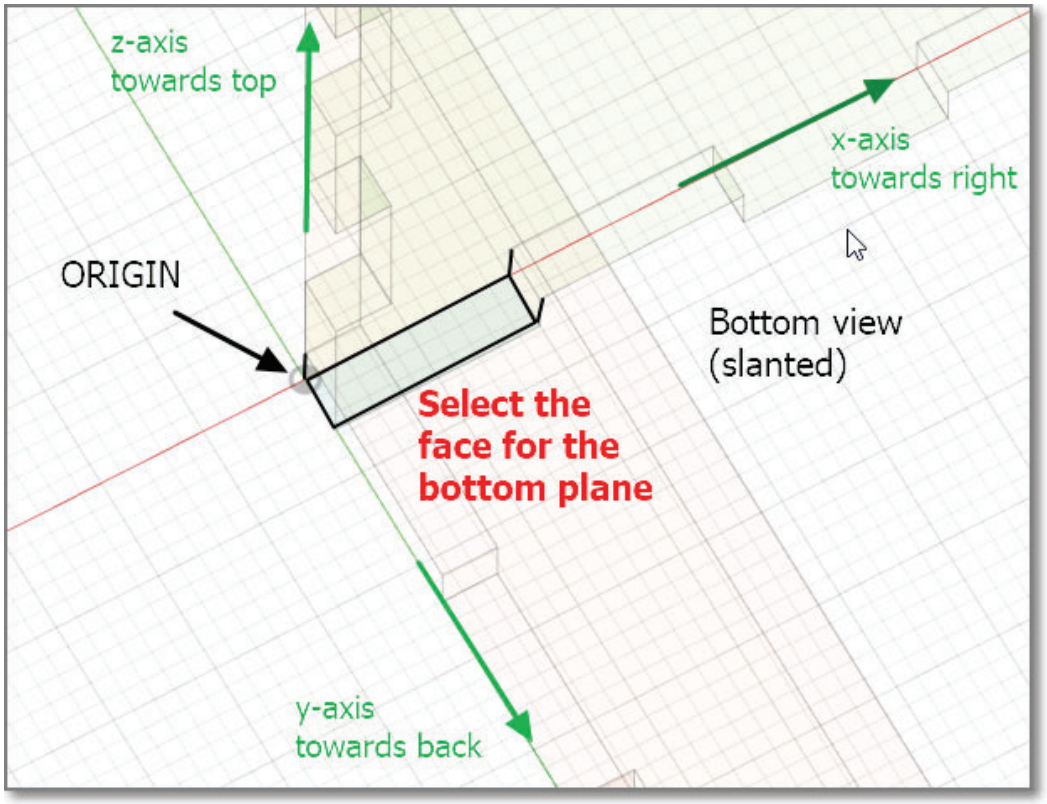
Mirror front to form back



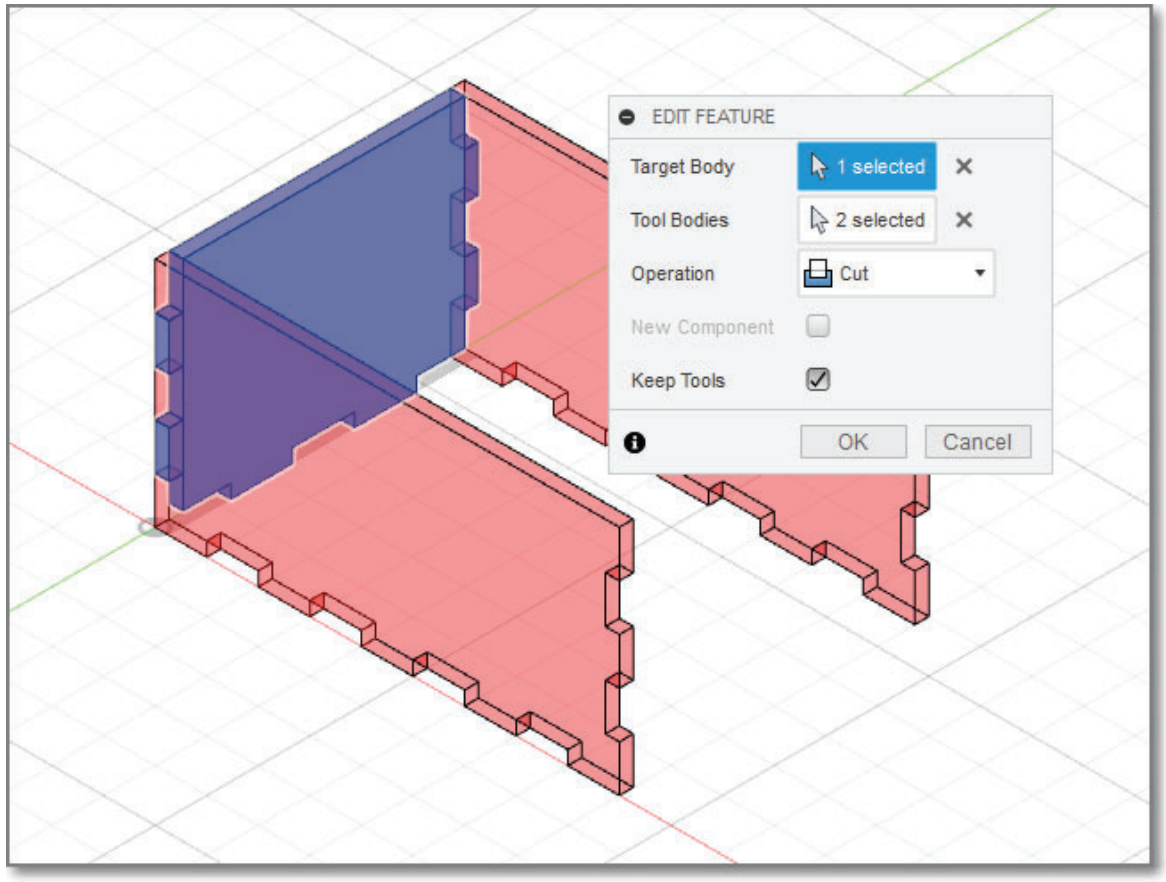
- Create a mid-plane
  - Switch off visibility of front body to help
  - Choose front and rear edges of side
- Mirror the front using the mid-plane
- Repeat for left and right sides

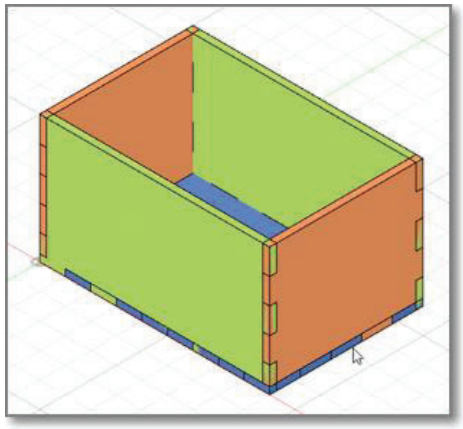
Create the base

- Rotate the object to bottom view
- Create new component
  - Create sketch
  - Start from ORIGIN
  - Sketch the base
  - Constraint to edges
  - Extrude



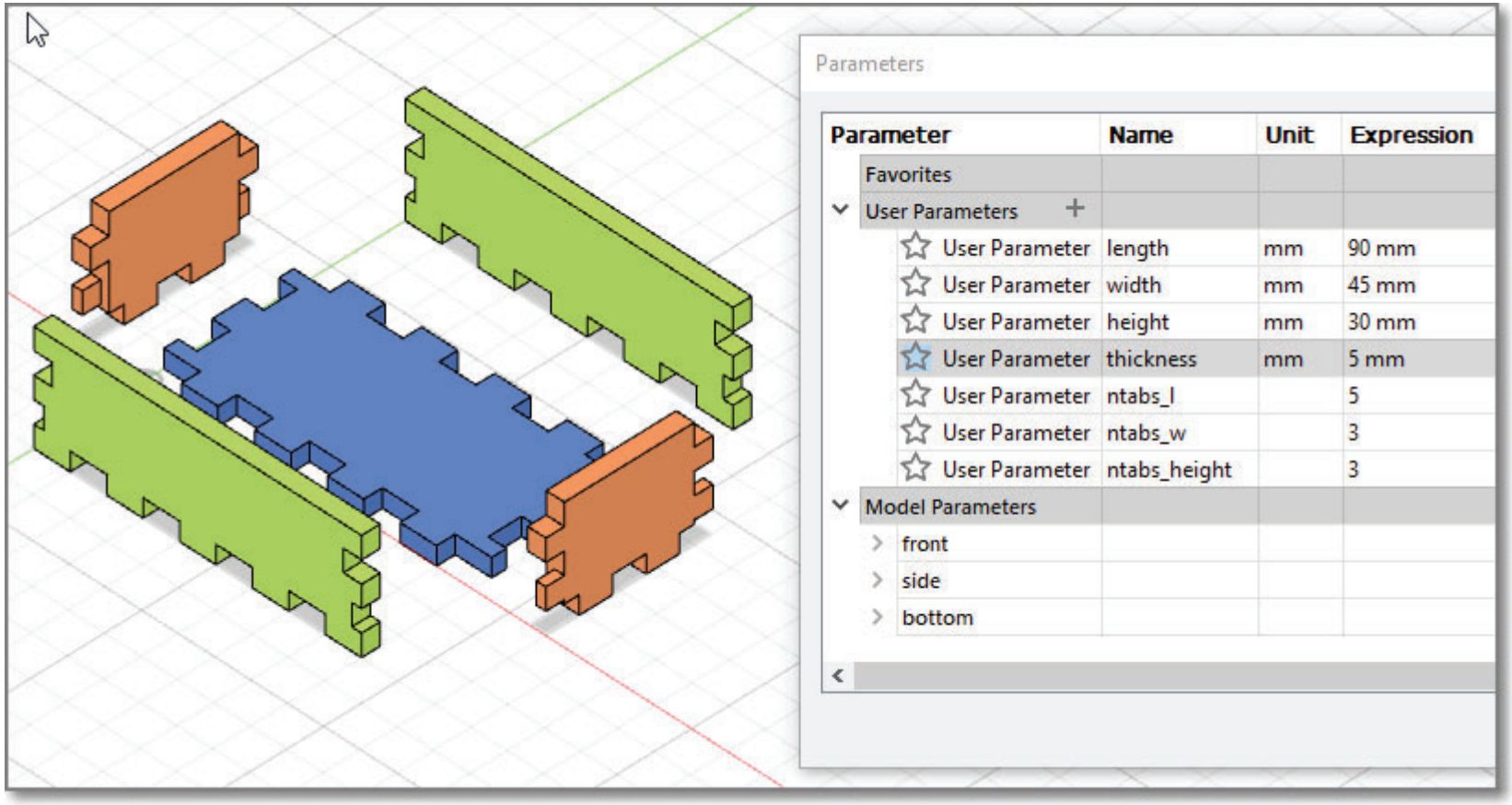
Combine





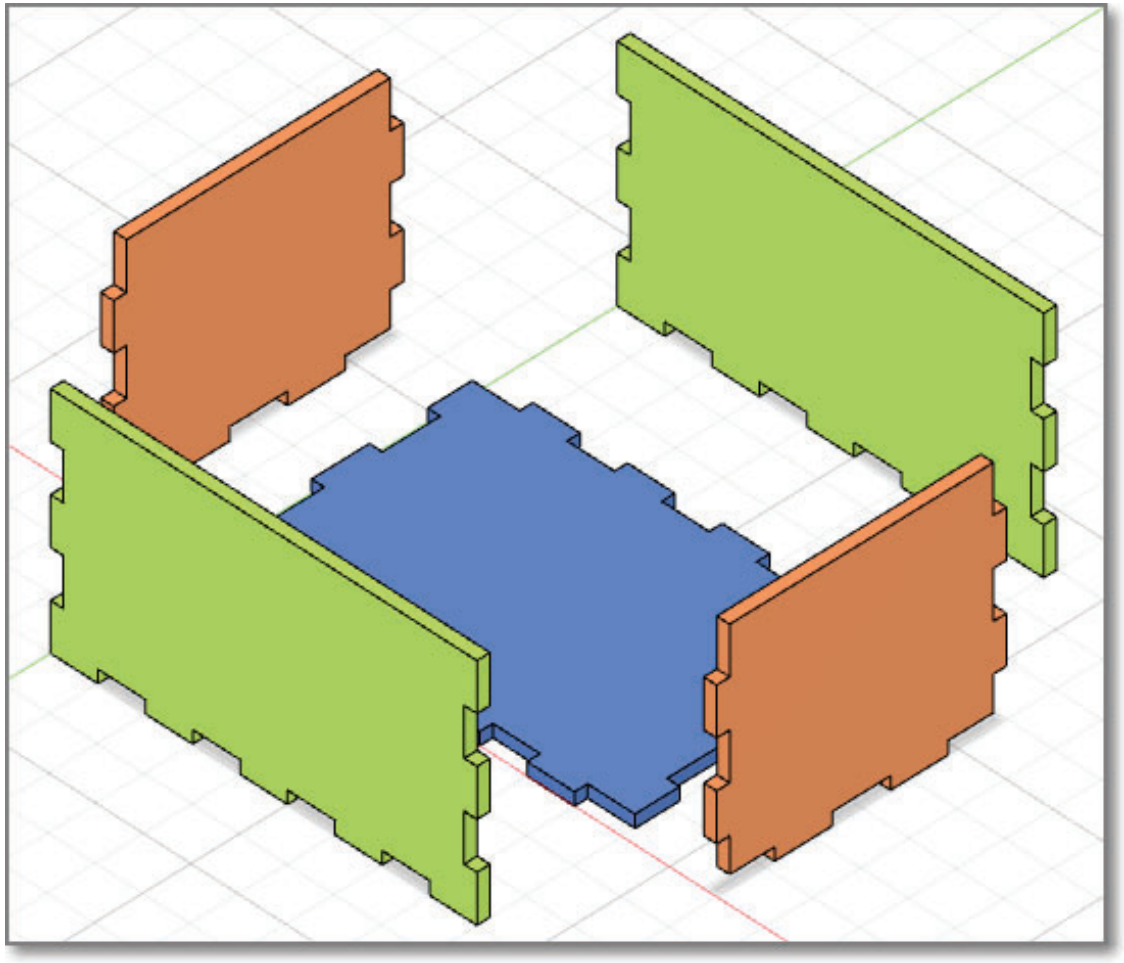
- Use the combine tool to create the tabs.
- Turn OFF components that are not used to improve visibility

Completed Model



- Change your parameters, the box should change without problems
- Some parameters do not work that well (which ones, why?)

Check Model



- Export and check the DXF of each of the components. Align them for laser cutting
- **Q**:
  Does the thickness of the material affect the DXF output for laser cutting?

Assignment: Accessories Box

- You are to create an accessories box with either movable lid or door and drawers specifications as follows:
  - Must have a movable lid or door
  - Must have drawers
  - Must be lasercut (wood 2.5~3.6mm)
  - Drawn and modelled in Fusion 360
  - Can be glued only on the joints
  - No nails, hinges etc
  - Must be “decorated” in terms of design aesthetic

Example

- Search: Laser Cut Accessories Box

DIY Box

- Multi layer box design
- Must be completely assembled and no falling off parts
- Measurements for box design to be around A5 size and no smaller than A6

Marking Scheme

Item	Description	Score
1	Fusion 360 • Box design (.f3d included) – 25% • Lid / Door & Drawer – 25%	50%
2	Laser cut box fitting	20%
3	Write-up (how-to)	20%
4	Fitting, Enhancements	10%

Deadline for submission: Monday, Week 2 Term 2 (During Class)

EP1000
Computer Controlled Cutting 2
End