# AUTODESK FUSION 360 EXERCISES

CSE 590 Ubiquitous Computing | Lecture 9 | May 24

Jon Froehlich • **Liang He (TA)**

DESIGN USE BUILD

MAKEABILITY LAB

PAUL G. ALLEN SCHOOL
OF COMPUTER SCIENCE & ENGINEERING

UNIVERSITY of WASHINGTON

# Make a keychain

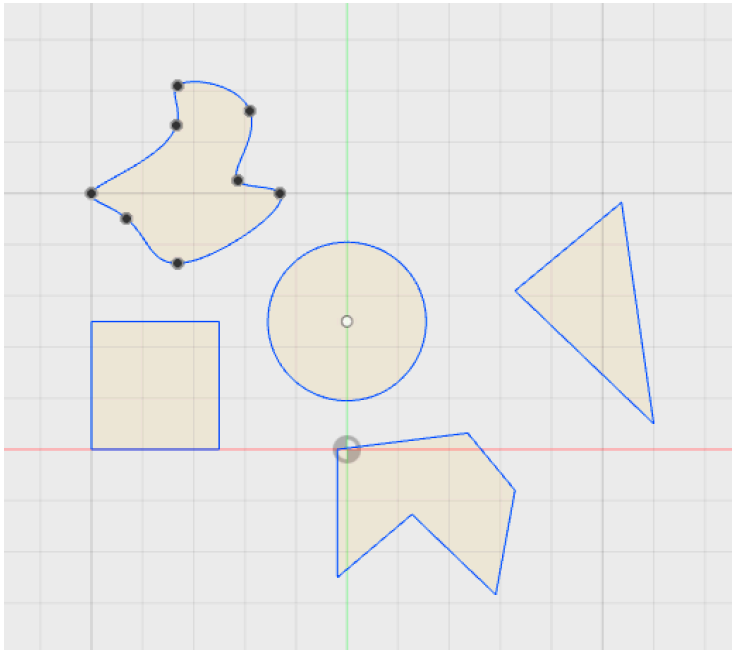
AUTODESK FUSION 360 DEMO

# Live Demo + 3D Printing

VIDEO: HTTPS://YOUTU.BE/EJIOCYO_4MO

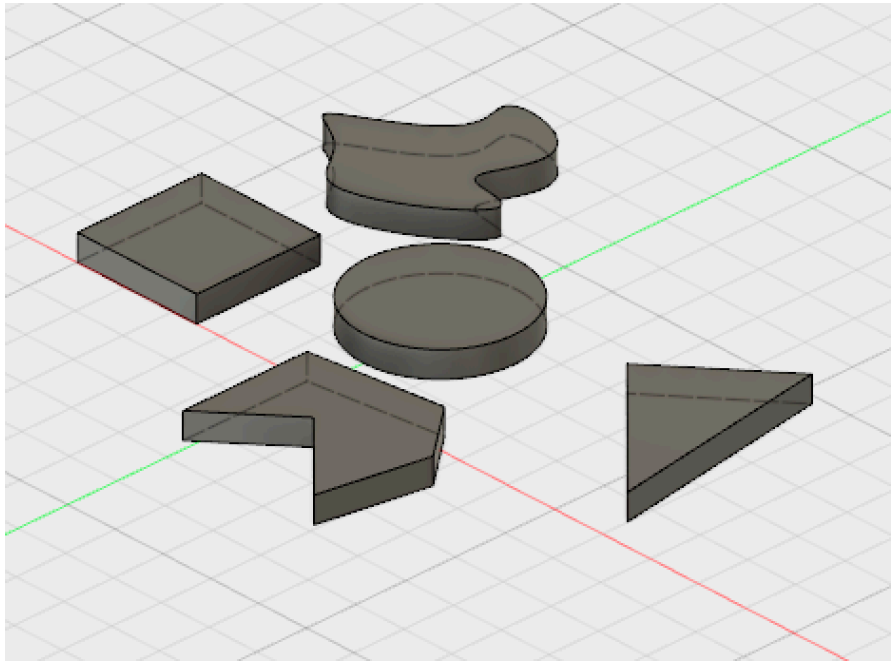
BASIC OPERATIONS

# MAKING 3D SHAPES FROM 2D SKETCHES (PART 1)



**2D Sketches:** Use lines and curves to draw arbitrary 2D shapes on a 2D plane

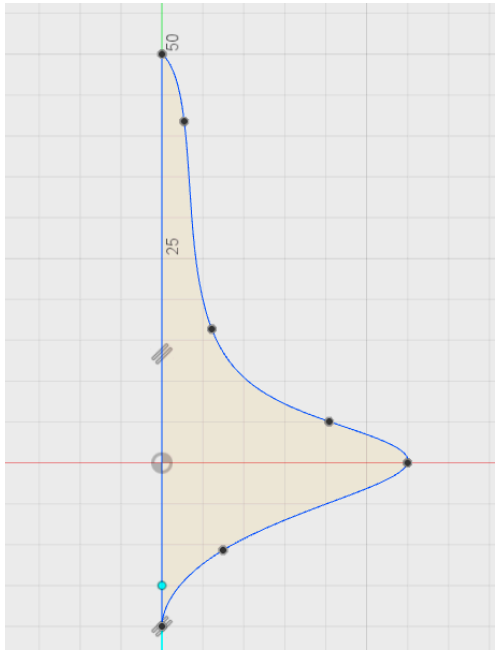
EXTRUSION



**3D Geometries:** Use extrusion to generate 3D solid geometries from the 2D shapes.

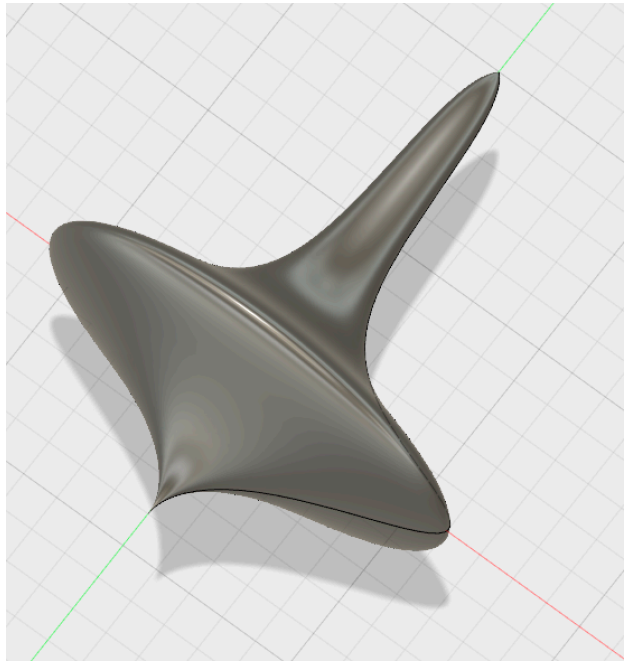
BASIC OPERATIONS

# MAKING 3D SHAPES FROM 2D SKETCHES (PART 2)




2D Profile

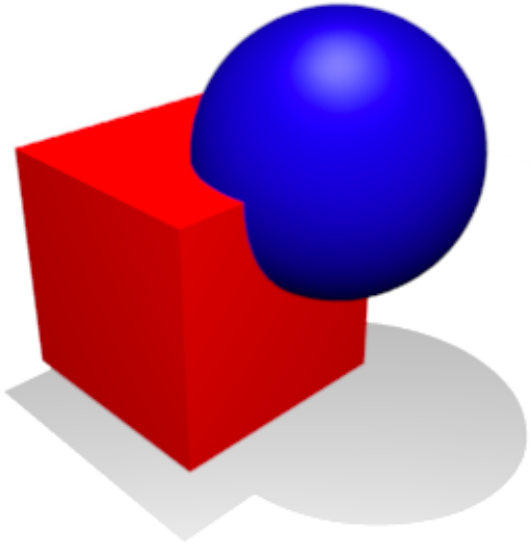
REVOLVE



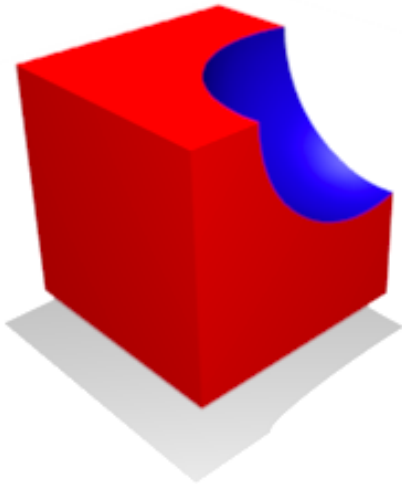
3D Solid

BASIC OPERATIONS

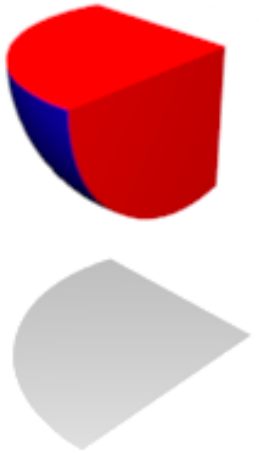
# BOOLEAN OPERATIONS



**Union/Join:** Merge multiple objects into one.



**Difference/Subtraction:** Subtract one object from another.



**Intersection:** Portion common to both objects.

Source: Constructive solid geometry (https://en.wikipedia.org/wiki/Constructive_solid_geometry)

# Make a case for RedBear Duo

3D PRINTING IN-CLASS EXERCISE

IN-CLASS EXERCISES

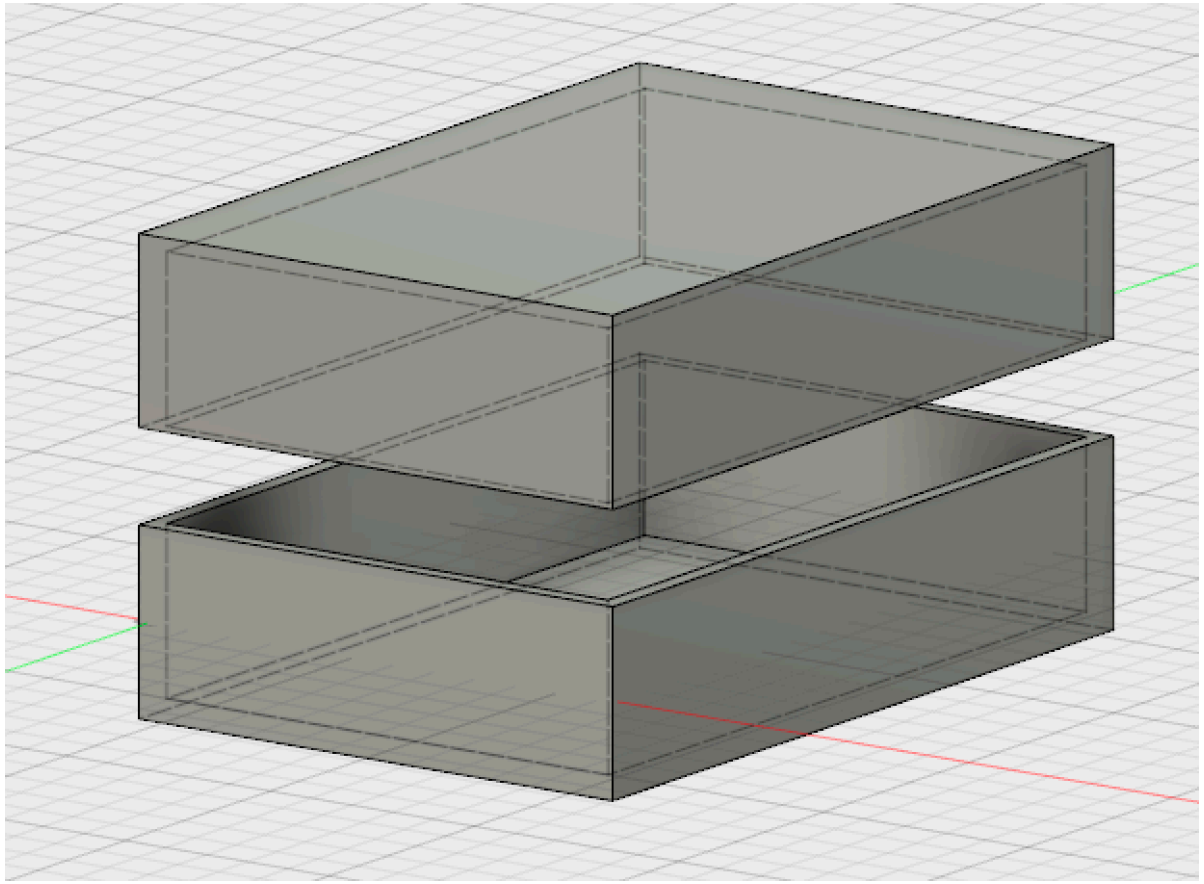
# LEARNING GOALS:

1. Learn about the basic interface of Autodesk Fusion 360 and how to make 3D models in an off-the-shelf CAD tool;
2. Understand basic operations including 2D sketching, extrusion, Boolean operations on 3D geometries in Fusion;
3. Practice and get familiar with the 3D modeling process, including measuring and CAD modeling;
4. Prepare 3D model for 3D printing.

IN-CLASS EXERCISES

# PART 1: CREATING A CASE

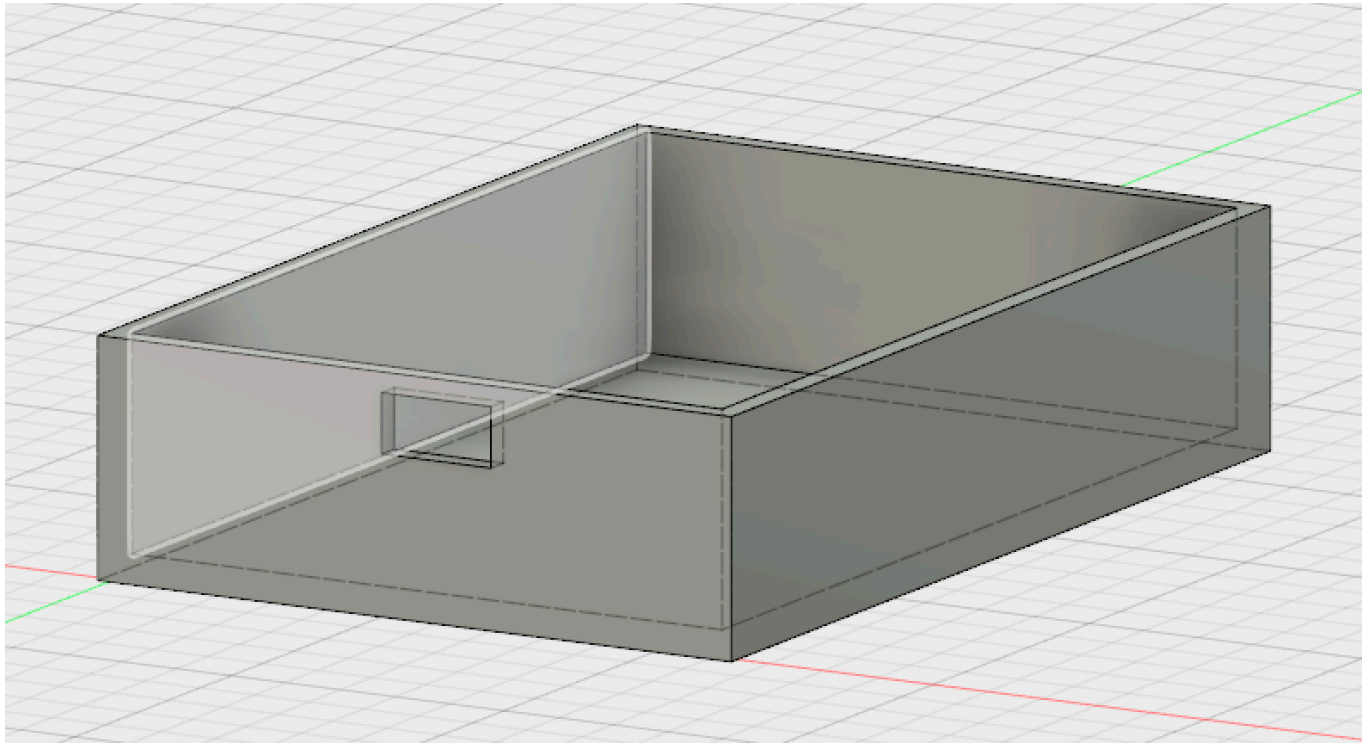
1. Measure the size of breadboard;
2. Make a box with measured size (leave 1mm for tolerance);
3. Make a shell from the box;
4. Split the box into two parts: top and bottom.



IN-CLASS EXERCISES

# PART 2: MAKE OPENINGS FOR THE CABLE

1. Measure the position and the size of the micro-USB port;
2. Create and position a sketch on the created case in Fusion (tolerance);
3. Subtract and make an opening for the port;
4. What about other wires?



IN-CLASS EXERCISES

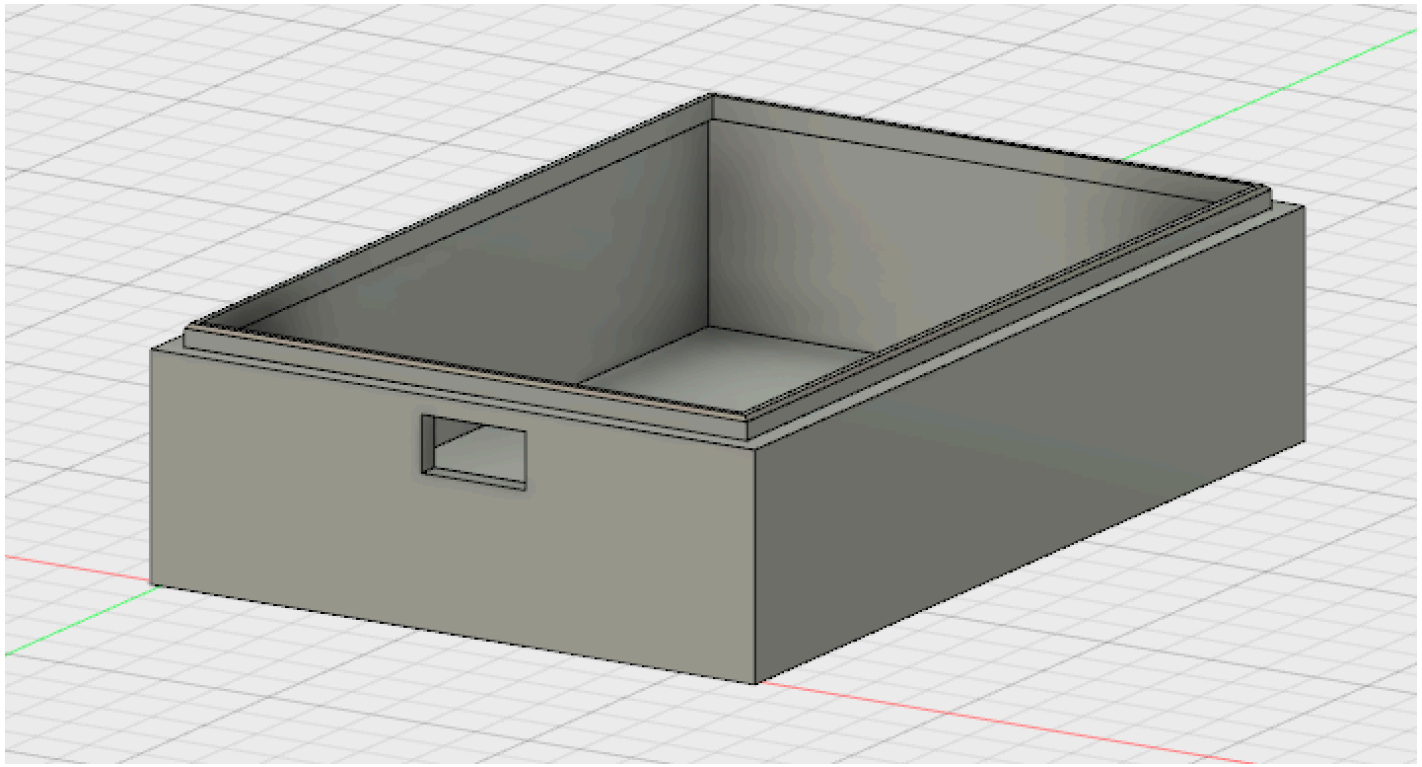
# PART 3: ADD DESIGN TO THE TOP

1. Use your creativity and add your 3D design on the top;
2. Consider which components (e.g., the LED, the buzzer) you want to expose;
3. Measure and model.

IN-CLASS EXERCISES

# PART 4: CREATE AN INNER WALL FOR CLOSING THE CASE

1. Make an inner wall (0.6mm thickness) along interior sides of the bottom;
2. Add chamfers;
3. What should be considered?



VIDEO: HTTPS://YOUTU.BE/IDZES9BDESK