

## Procedure for Perceptual Shift – Blender

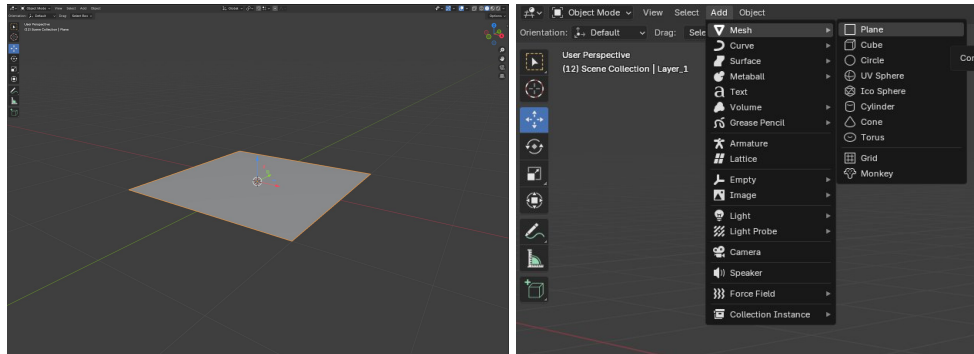
This mini-project walks you through building a Blender-based perceptual-shift sculpture—an illusion that snaps from apparent chaos into a image when viewed from a single point. Inspired by Michael Murphy's installation Perceptual Shift, in which 1 252 suspended black spheres align to form an eye, the tutorial demonstrates how to slice, layer, and position fragments so they coalesce into the BITS logo from one precise angle.

After completing the procedure, you can adapt the workflow to invent your own anamorphic creations; the specific learning outcomes are listed below.

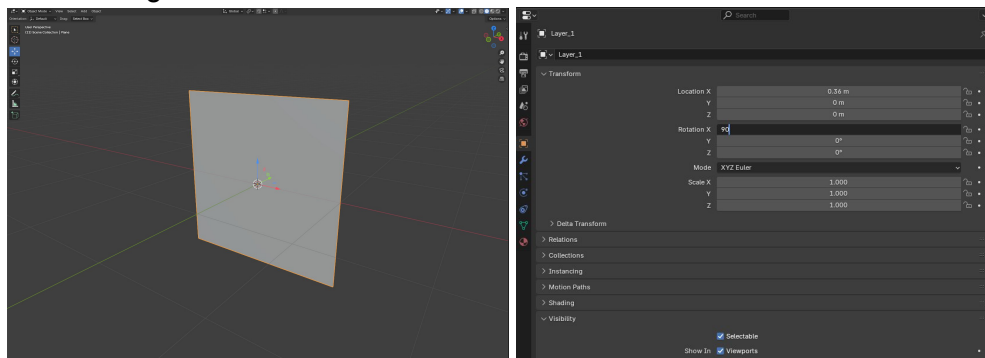
### Learning Outputs

- **3D Modelling Fundamentals**
  - Navigate Blender's UI, add/transform objects, and manage collections.
  - Import an SVG, convert it to a mesh, and clean up geometry.
- **Center of Mass & Hanging/Standing Mechanism**
  - Locate/adjust an object's centre of mass, design hanging/standing points for balancing the object.
- **Curve — Mesh Workflows**
  - Extrude, bevel, and/or solidify flat vector into print-ready 3-D forms.
- **Spatial Layering & Anamorphic Design**
  - Slice a model into fragments, distribute them across multiple planes, and align them so they form a readable image from a single camera view.
- **Precision Camera & Alignment Tools**
  - Lock a camera to an "illusion point," use snapping/empties for reference, and verify alignment from alternate angles.
- **Physical Assembly Workflow**
  - Design a standing plate, label layers, and assemble fragments into a stable, illusion-ready sculpture.

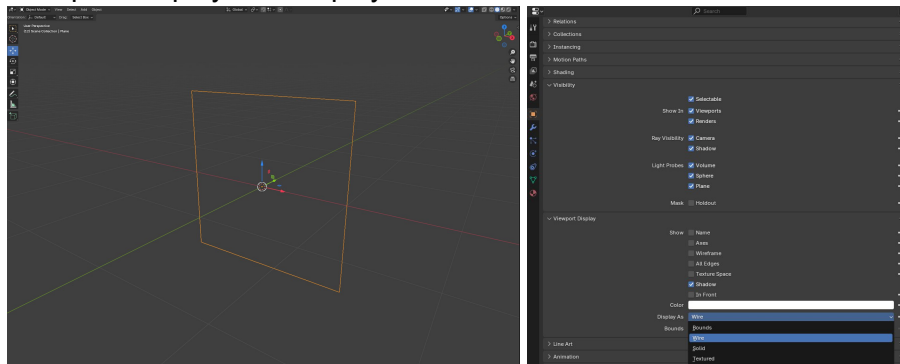
1. The beginning of the project the items will be provided. They can be arranged according to visual of the logo.
2. Adding layers into space to adjust the illusion of the objects
  - a. In object mode, Add —> Mesh —> Plane. The Plane will be looking like below.



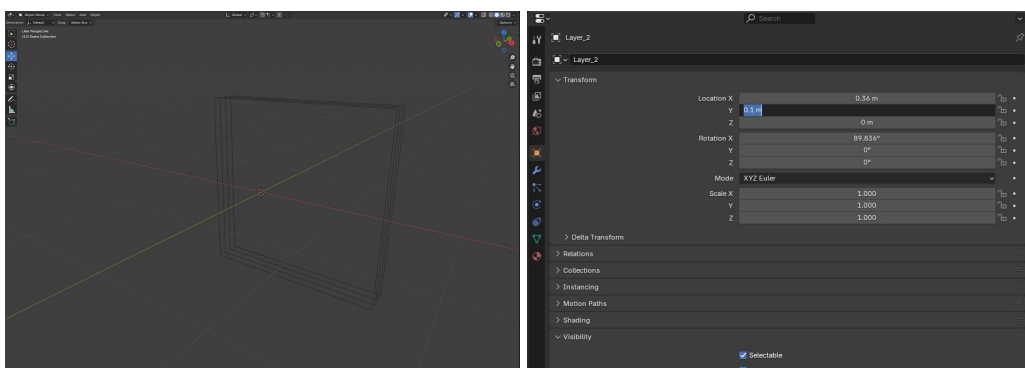
- b. After adding the plane, the rotation should be 90° so we can see it from the camera angle. Transform —> Rotation —> X = 90°



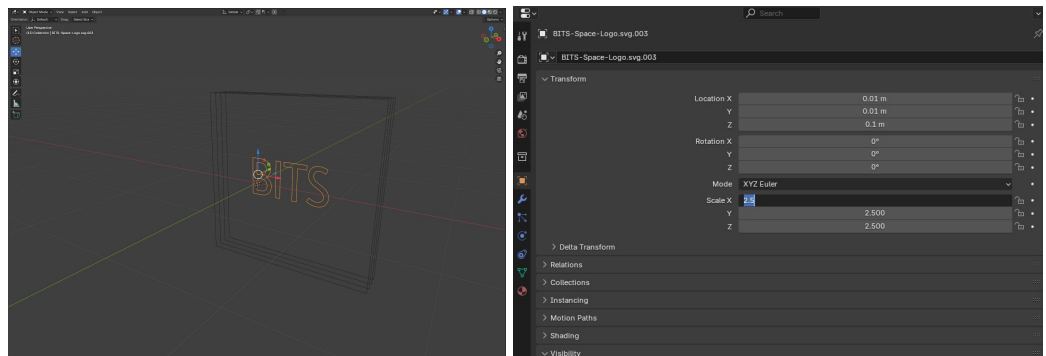
- c. The plane also should be transparent so we can add objects layer by layer. Viewport Display —> Display as —> Wire



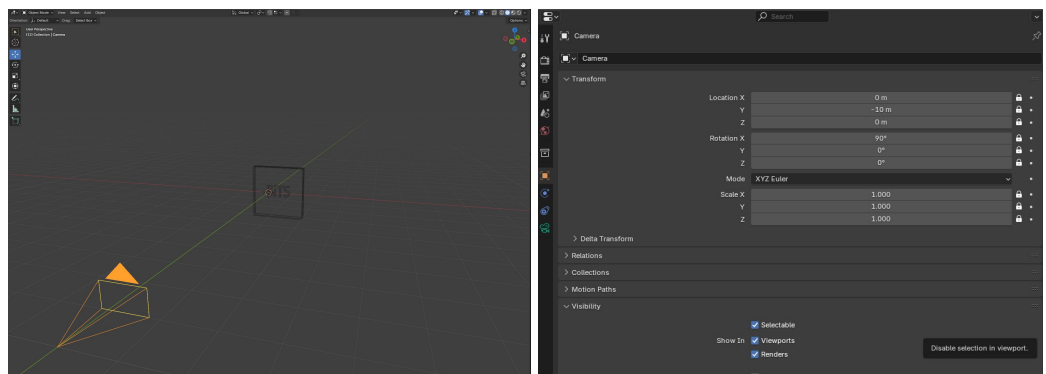
- d. At the end, we will have 4 different planes, positions as 0, 0.1, 0.2, and 0.3. Transform —> Location X = 0, 0.1, 0.2 and 0.3 for each plane respectively.



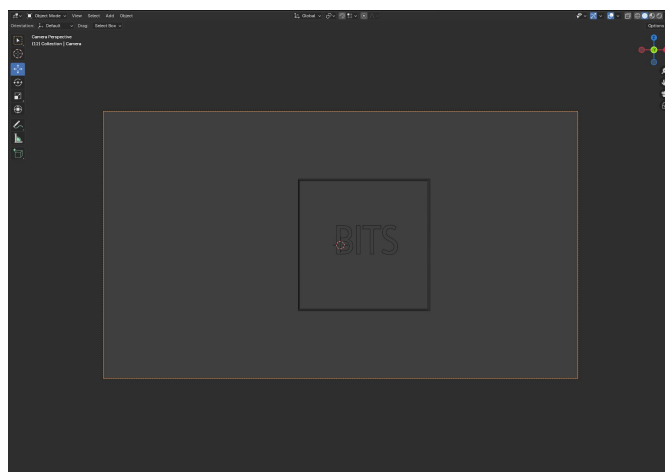
3. Add "BITS" into the first layer to make the logo precise
  - a. Take and drop the BITS logo svg file into environment. Then, scale the image accordingly.



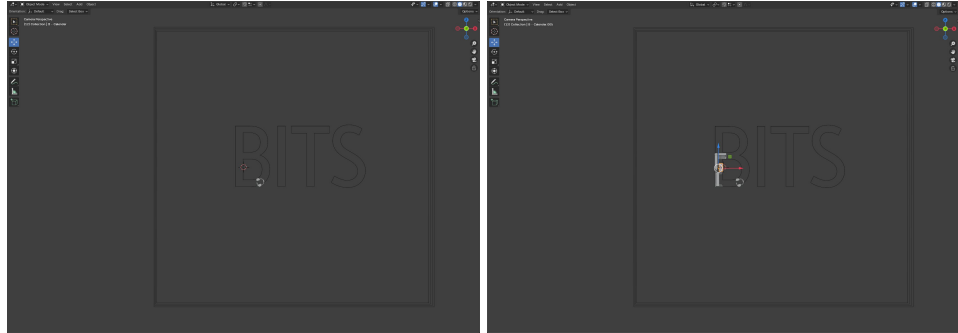
4. Adding camera into environment and position it as viewpoint so we can arrange the objects accordingly
  - a. Adjust the camera location and the rotation according to BITS logo.



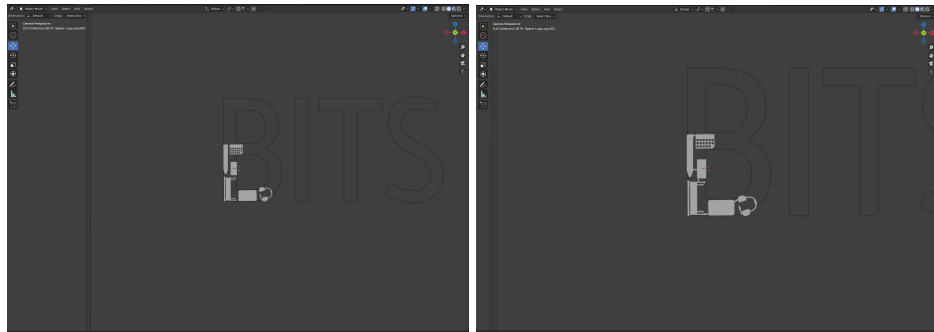
5. As an end result, the camera view will be like below. We start to add the objects into frame always in camera view so we can see the alignments.



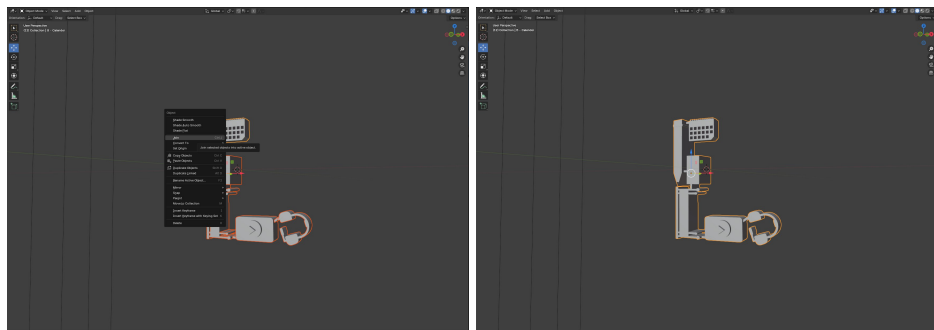
6. Start to add objects into space and arrange them accordingly.
  - a. As a first step, add several objects into level “0” and try to make one part of the letter. In this case it will be letter “B”.
  - b. Scaling of the individual object should be done separately before merging all the items in the same level.
    - i. The object’s size, dimensions, thickness can be changed in this step to make the logo be seen as much as possible.
    - ii. While adjusting these features, be aware of the principle of 3D printing.



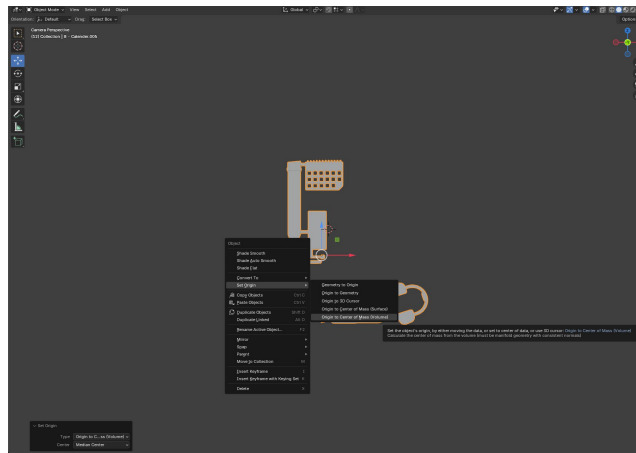
- c. After adding the objects, add support structures to keep the objects group together.



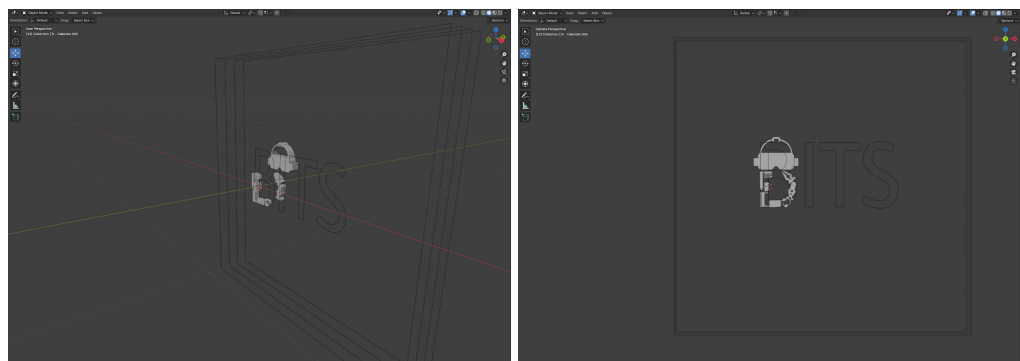
- d. Then, you can join the objects and support structure in one object. Select all items —> right click —> Join



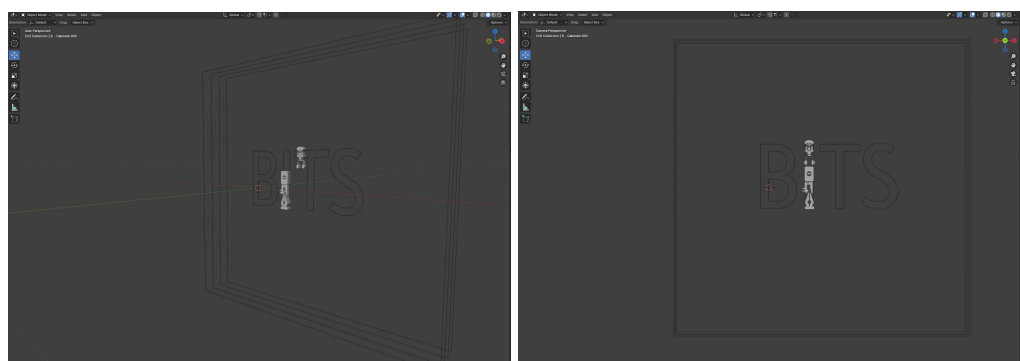
- e. After joining all the items, set the origin to “Center of Mass (Volume)”. This provides information about center of mass of the whole object. It is important to know the balancing point of the whole object for further steps. Right Click → Set Origin → Origin to Center of Mass (Volume).



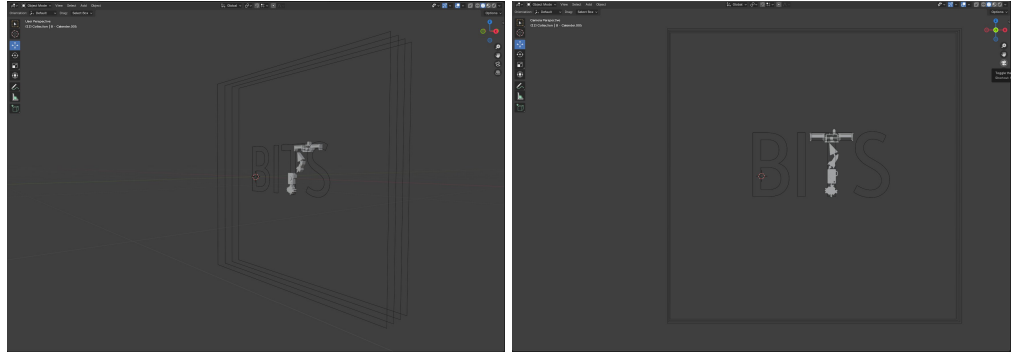
7. Repeat this loop till you cover all the letters in the “BITS” logo.
  - a. For the letter “B”, there are three layers (0, 0.1 and 0.2). The objects are layered according to the illusion perspective.



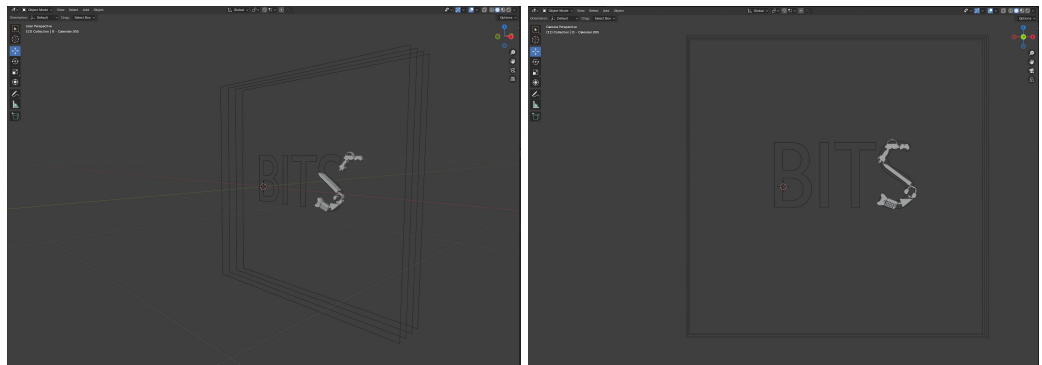
- b. For the letter “I”, there are two layers (0 and 0.2).



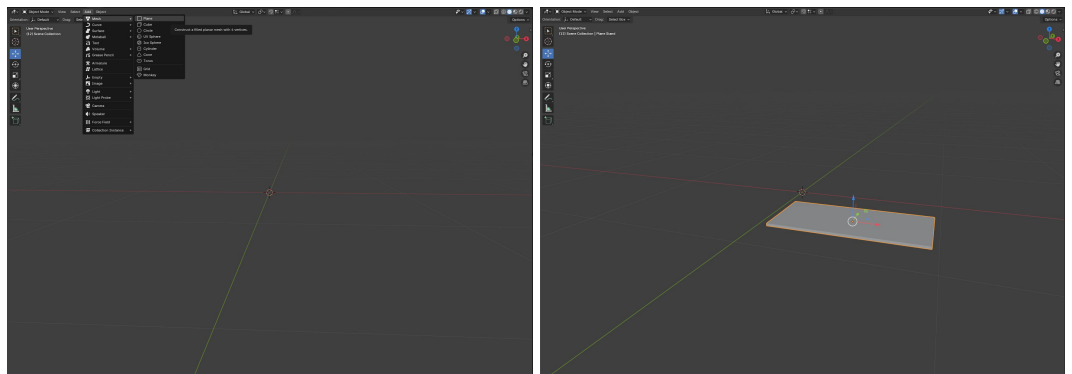
- c. For the letter “T”, there are three layers (0, 0.1 and 0.2)



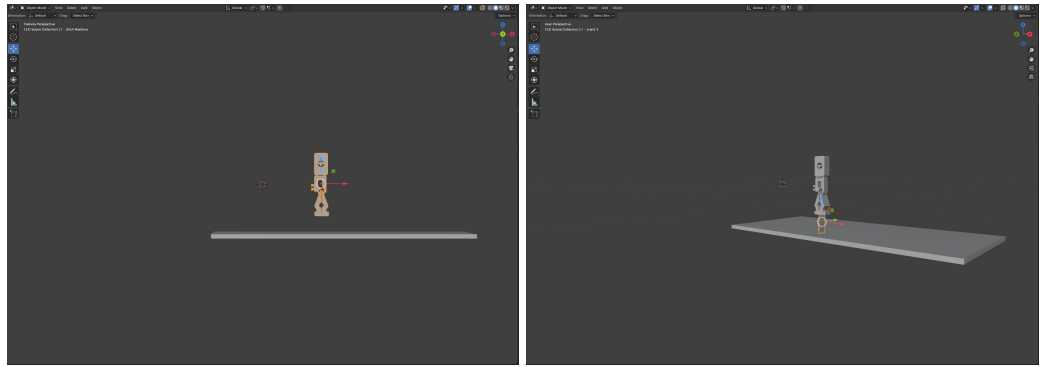
- d. For the letter “S”, there are two layers (0 and 0.3)



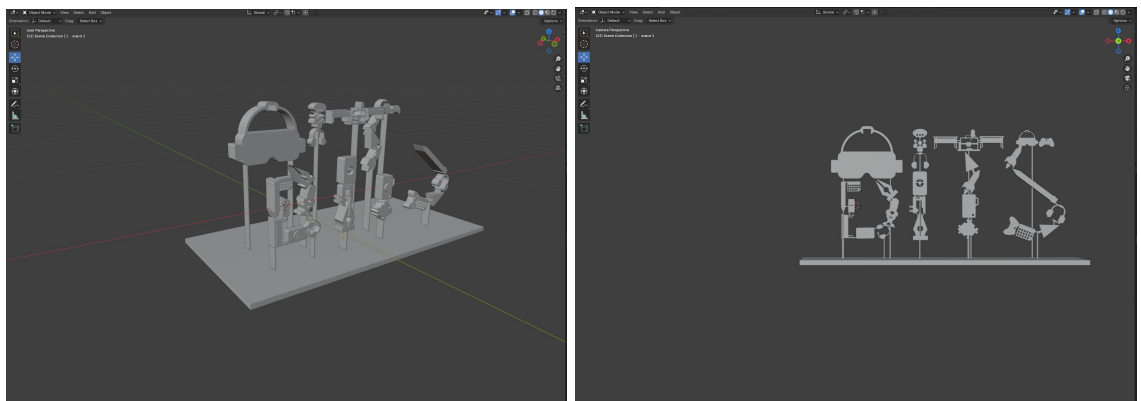
8. For making the objects standing, add a plane into the environment.
- After adding the plane, adjust the dimensions so it can fit all the items designed. In this case, dimensions are  $X=0.6$ ,  $Y=0.3$ , and  $Z=0.01$ .



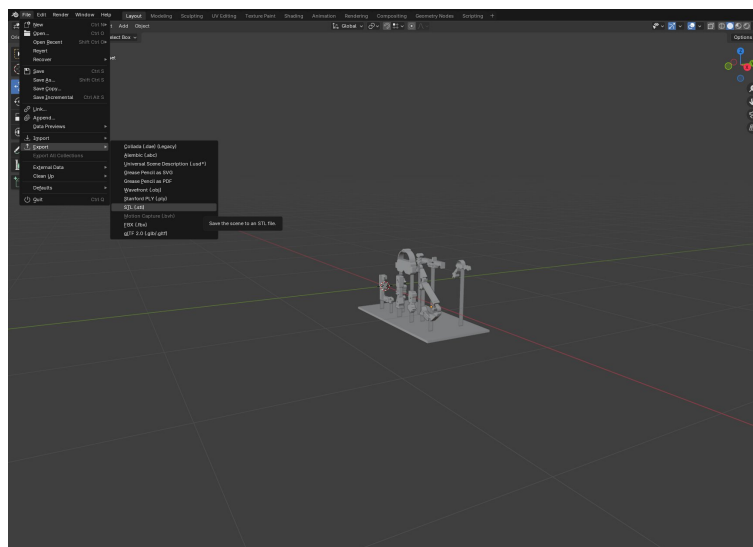
9. Now, add the support structure for each design part of the letters.
- To make this, select respected items and join them. So we will make a whole object from several items.
  - To find the center of mass where the standing structure will be, Right Click —> Set Origin —> Origin to Center of Mass (Volume).
  - Put the supporting structure exactly the center of mass coordination.
  - As an example, we can do the letter “I”. The center of mass of whole object is  $X=0.27$  so, we will put the support structure in that position.



10. Repeat the previous step for other parts.
11. So at the end, you will have all the part of the letter and the support structure. The items should be arrange well that the support structures are not that much visible from the view point. You can see the final result below.



12. After finishing the design, export as an .stl form to print in 3D printer.
  - a. File —> Export —> STL .stl



13. Now, we have -ready to print- file.

