Creating a name plate with a raised image or raised text.

Before you start, you need to determine your background (shape or image) and your foreground (shape, image, or text).

Basic shapes:

Here are some basic shapes you may want to use:

- `Disk[{0,0},5]` is a filled-in circle centered at (0,0) with radius 5.
- `Disk[{0,0},{6,4}]` is a filled-in ellipse centered at (0,0) with major axis 6 and minor axis 4.
- `RegularPolygon[n]` is a filled-in regular n-gon.
- `Rectangle[{x1,y1},{x2,y2}]` is a rectangle with corners (x1,y1), (x1,y2), (x2,y2), and (x2,y1).

Then transform it into a mesh using

```mathematica
shape = DiscretizeGraphics[Graphics[<the shape you chose here>]]
```

Using an image:

If you want to use an image as your foreground or background, drag and drop it into Mathematica and give it a name, like this:

```mathematica
flower = ;
```

(If your image has grayscale or colors, you will probably want to use `Binarize`.)

Transform it into a mesh using:

```mathematica
image = ImageMesh[ColorNegate[flower]]
```

Using text:

If you want to use text as your foreground, update your text, font, and font size:

```mathematica
word = Text[
        Style["word", Bold, FontFamily -> "Bauhaus 93", FontSize -> 50]]
```

Discretize it using:

```mathematica
text = DiscretizeGraphics[word, _Text]
```
Putting it all together:

Choose which of these things is your foreground and background, and use RegionResize to make sure that the foreground fits into the background: (You may need to modify the constants.)

\[
\text{resizedShape} = \text{RegionResize[shape, 1.3]}
\]
\[
\text{resizedImage} = \text{RegionResize[image, 1]}
\]

We are going to need to move these regions to have the same center:

\[
\text{translatedShape} = \text{TransformedRegion[}
\text{    resizedShape,}
\text{    TranslationTransform[}
\text{        -Map[Mean, RegionBounds[resizedShape]]}
\text{    ]}
\text{]}
\]
\[
\text{translatedImage} = \text{TransformedRegion[}
\text{    resizedImage,}
\text{    TranslationTransform[}
\text{        -Map[Mean, RegionBounds[resizedImage]]}
\text{    ]}
\text{]}
\]

Display them both together to make sure they are overlapping the right way:

\[
\text{Show[translatedShape, translatedImage]}
\]

If so, you’re ready to continue. Define the background and the foreground:

\[
\text{background} = \text{translatedShape}
\]
\[
\text{foreground} = \text{translatedImage}
\]

Use Mathematica to determine the background minus the foreground, and the boundaries:

\[
\text{middle} = \text{BoundaryDiscretizeRegion[RegionDifference[background, foreground]]}
\]
\[
\text{outerboundary} = \text{RegionBoundary[background]};
\]
\[
\text{innerboundary} = \text{RegionBoundary[foreground]};
\]

Now construct all the polygons for the name plate. Adjust the values of the heights as necessary.

\[
\text{nameplate} = \text{Show[}
\text{    RegionProduct[background, Point[{{0.}}]],}
\text{    RegionProduct[outerboundary, Line[{{0.}, {.1}}]],}
\text{    RegionProduct[middle, Point[{{.1}}]],}
\text{    RegionProduct[innerboundary, Line[{{.1}, {.2}}]],}
\text{    RegionProduct[foreground, Point[{{.2}}]]}
\text{]}
\]

Last, export your file to STL:

\[
\text{Export[NotebookDirectory[] <> "nameplate.stl", nameplate]}
\]