Report_week2_ssa_24b1312

Screenshots and other results:
https://docs.google.com/document/d/1IS5JgKKV0C4lu51GGOmVsnRMUaxeR-0tQ4lGVAvFQ6s/edit?usp=sharing

docker ps: see all running containers

```
docker run -it \
  --name gds2stl \
  -v ~/Desktop:/data \
  ubuntu:22.04 \
  /bin/bash
```

// name of my container is gds2stl !

(I made a new container already had 1 ros2 and 2 openlane containers but preferred making another one to avoid hassle)24b1312

root = the superuser (administrator) of Linux
sudo = "Super User DO", It lets a normal user temporarily act as root.
Do if already root, command should not be starting with a sudo as irrelevant

If you run
hostname
You can see which container you are in

Then i followed the notion page itself
Until I found an error : triangles in requirements.txt was causing it
Easy fix: install nano since it is not so by default and then nano requirement.txt
Do the changes then ctrl O , then enter , then ctrl X ,

Again notion page

cp <SOURCE> <DESTINATION>

ls /data

literally means:

> **Show me everything that exists on my Mac Desktop, but from inside the Docker container.**

cp /data/ks_adder.gds . (run this command in that directory where you want your file ks_aadder.gds to get pasted, dot does that at the end)

Error : had to remove import triangles from gdsiistl.py

Note : using simple_gds_to_stl.py rather than gdsiistl.py, because the latter was not meant for editing , I did not want to use triangles, it wasn't accepting that and throwing too many errors .

nano simple_gds_to_stl.py // and saved the below code in that , a sweet one!

```
import sys
import gdspy
import numpy as np
from stl import mesh

if len(sys.argv) < 2:
    print("Usage: python simple_gds_to_stl.py file.gds")
    sys.exit(1)

gds_file = sys.argv[1]

print("Reading GDS...")
lib = gdspy.GdsLibrary()
lib.read_gds(gds_file)
cells = lib.top_level()

layers = {}

for cell in cells:
    cell = cell.flatten()
    for poly in cell.polygons:
        layer = (int(poly.layers[0]), int(poly.datatypes[0]))
        layers.setdefault(layer, [])
```

```
        for p in poly.polygons:
            layers[layer].append(p)

print("Generating STL files...")

for layer, polys in layers.items():
    triangles = []

    for poly in polys:
        zmin, zmax = 0.0, 0.2

        # simple fan triangulation
        for i in range(1, len(poly) - 1):
            tri2d = np.array([poly[0], poly[i], poly[i + 1]])

            bottom = np.insert(tri2d, 2, zmin, axis=1)
            top = np.insert(tri2d, 2, zmax, axis=1)

            triangles.append(bottom)
            triangles.append(top[::-1])

    if not triangles:
        continue

    data = np.zeros(len(triangles), dtype=mesh.Mesh.dtype)
    data["vectors"] = triangles

    m = mesh.Mesh(data)
    out = f"{gds_file}_layer_{layer[0]}_{layer[1]}.stl"
    m.save(out)
    print("  wrote", out)

print("Done.")
```

i/p:

```
(venv) root@7ac9dcf8865e:~/gdsiistl# python simple_gds_to_stl.py
ks_adder.gds
```

o/p:

```
 Reading GDS...
 Generating STL files...
  wrote ks_adder.gds_layer_235_4.stl
  wrote ks_adder.gds_layer_67_20.stl
  wrote ks_adder.gds_layer_67_44.stl
  wrote ks_adder.gds_layer_68_20.stl
```

wrote ks_adder.gds_layer_68_44.stl
wrote ks_adder.gds_layer_69_20.stl
wrote ks_adder.gds_layer_69_44.stl
wrote ks_adder.gds_layer_70_20.stl
wrote ks_adder.gds_layer_70_44.stl
wrote ks_adder.gds_layer_71_20.stl
wrote ks_adder.gds_layer_71_44.stl
wrote ks_adder.gds_layer_72_20.stl
wrote ks_adder.gds_layer_72_16.stl
wrote ks_adder.gds_layer_71_16.stl
wrote ks_adder.gds_layer_70_16.stl
wrote ks_adder.gds_layer_69_16.stl
wrote ks_adder.gds_layer_236_0.stl
wrote ks_adder.gds_layer_68_16.stl
wrote ks_adder.gds_layer_64_16.stl
wrote ks_adder.gds_layer_122_16.stl
wrote ks_adder.gds_layer_65_20.stl
wrote ks_adder.gds_layer_78_44.stl
wrote ks_adder.gds_layer_93_44.stl
wrote ks_adder.gds_layer_64_20.stl
wrote ks_adder.gds_layer_94_20.stl
wrote ks_adder.gds_layer_81_4.stl
wrote ks_adder.gds_layer_95_20.stl
wrote ks_adder.gds_layer_66_20.stl
wrote ks_adder.gds_layer_66_44.stl
wrote ks_adder.gds_layer_67_16.stl
wrote ks_adder.gds_layer_65_44.stl
wrote ks_adder.gds_layer_81_23.stl
Done.
(venv) root@7ac9dcf8865e:~/gdsiistl#

Final step:
cp *.stl /mnt/c/Users/Sarthak/Desktop/
Note I need not run this
For me equivalent command is
cp *.stl /data/

Since when I started I did this
-v ~/Desktop:/data

Which means
/data inside container ↔ Desktop on your Mac

Week2_phyde_ssa copied all files in this folder on desktop
Moved stl files into this folder

Blender
One GDS layer = one STL file = one object in Blender