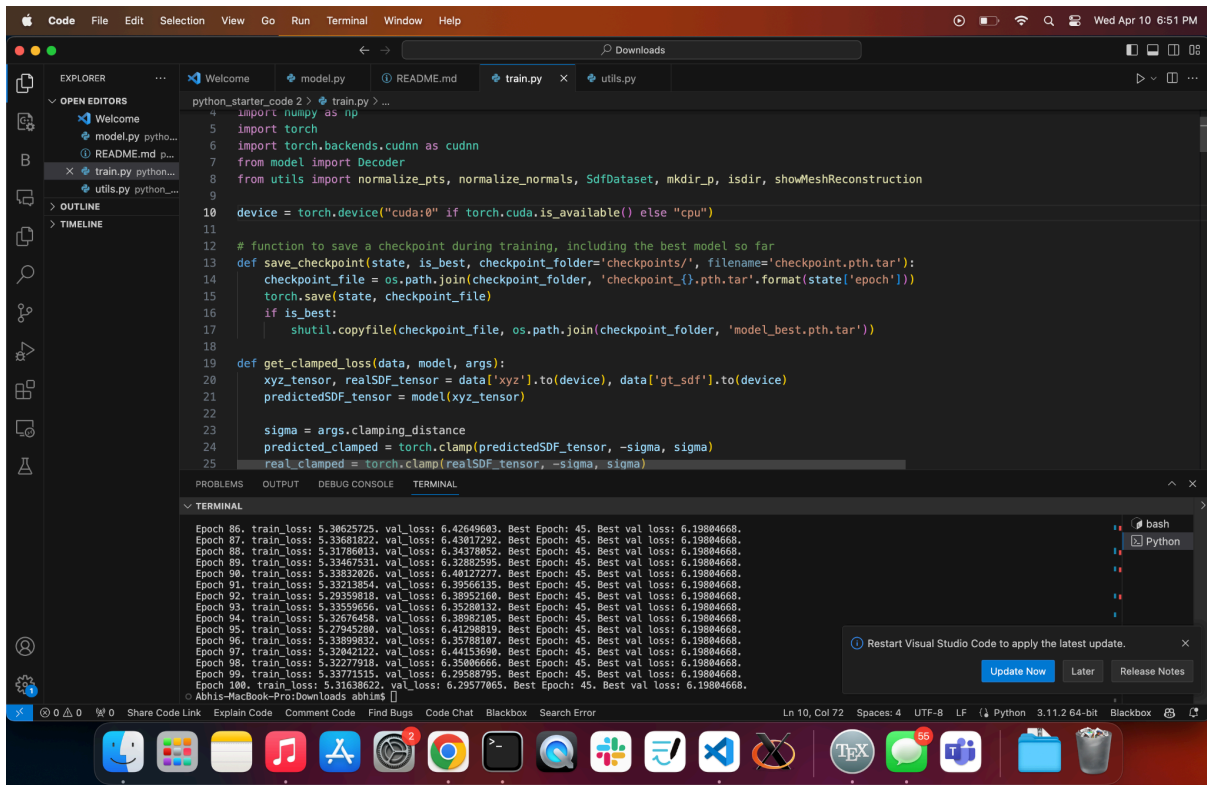


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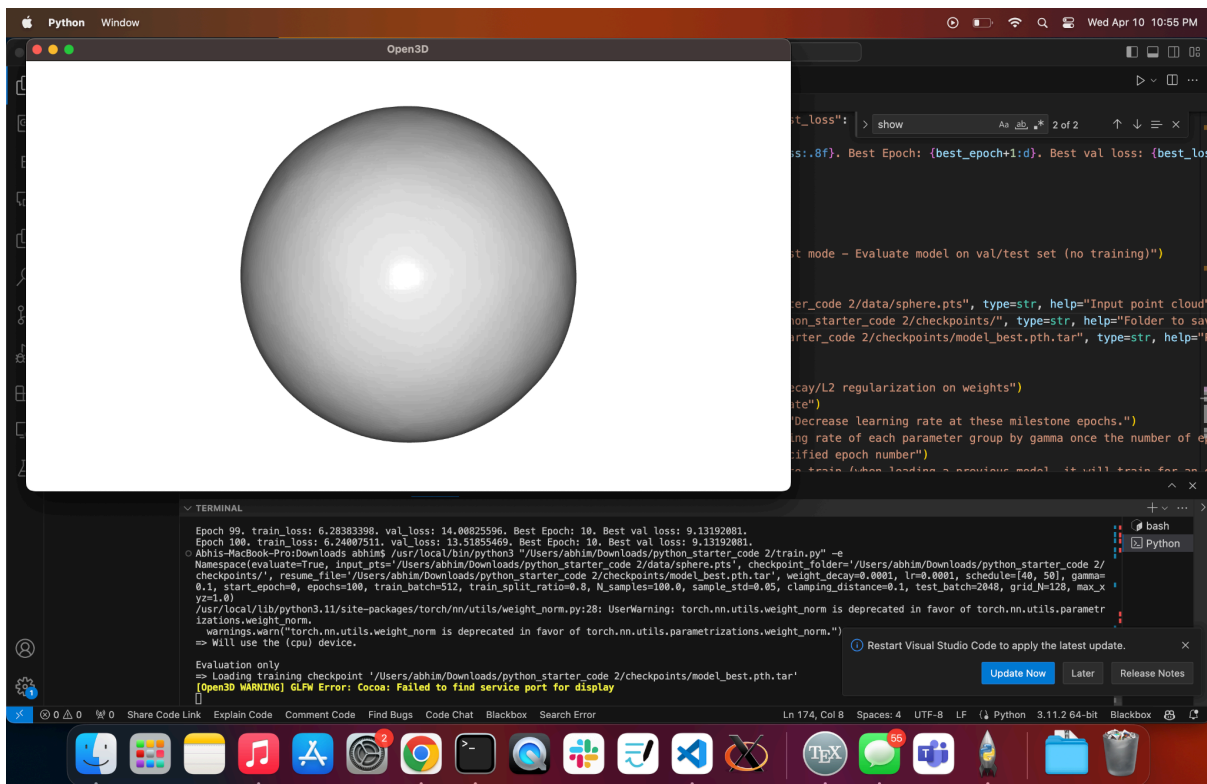


```
python_starter_code 2 > train.py ...
4 import numpy as np
5 import torch
6 import torch.backends.cudnn as cudnn
7 from model import Decoder
8 from utils import normalize_pts, normalize_normals, SdfDataset, mkdir_p, isdir, showMeshReconstruction
9
10 device = torch.device("cuda:0" if torch.cuda.is_available() else "cpu")
11
12 # function to save a checkpoint during training, including the best model so far
13 def save_checkpoint(state, is_best, checkpoint_folder='checkpoints/', filename='checkpoint.pth.tar'):
14     checkpoint_file = os.path.join(checkpoint_folder, 'checkpoint_{}.pth.tar'.format(state['epoch']))
15     torch.save(state, checkpoint_file)
16     if is_best:
17         shutil.copyfile(checkpoint_file, os.path.join(checkpoint_folder, 'model_best.pth.tar'))
18
19 def get_clamped_loss(data, model, args):
20     xyz_tensor, realSDF_tensor = data['xyz'].to(device), data['gt_sdf'].to(device)
21     predictedSDF_tensor = model(xyz_tensor)
22
23     sigma = args.clamping_distance
24     predicted_clamped = torch.clamp(predictedSDF_tensor, -sigma, sigma)
25     real_clamped = torch.clamp(realSDF_tensor, -sigma, sigma)
```

TERMINAL

```
Epoch 86. train_loss: 5.38625725, val_loss: 6.42649683, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 87. train_loss: 5.33681822, val_loss: 6.43817292, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 88. train_loss: 5.31786913, val_loss: 6.34378852, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 89. train_loss: 5.33467531, val_loss: 6.32882595, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 90. train_loss: 5.33932926, val_loss: 6.48127277, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 91. train_loss: 5.33213854, val_loss: 6.39566135, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 92. train_loss: 5.29359818, val_loss: 6.38952168, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 93. train_loss: 5.33539656, val_loss: 6.33288132, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 94. train_loss: 5.32676458, val_loss: 6.38982185, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 95. train_loss: 5.27945288, val_loss: 6.41298819, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 96. train_loss: 5.33999832, val_loss: 6.39788187, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 97. train_loss: 5.32842122, val_loss: 6.44153698, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 98. train_loss: 5.32277918, val_loss: 6.35886666, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 99. train_loss: 5.33771515, val_loss: 6.29588795, Best Epoch: 45, Best val loss: 6.19884668.
Epoch 100. train_loss: 5.31638622, val_loss: 6.29577865, Best Epoch: 45, Best val loss: 6.19884668.
```

Reconstructed sphere:



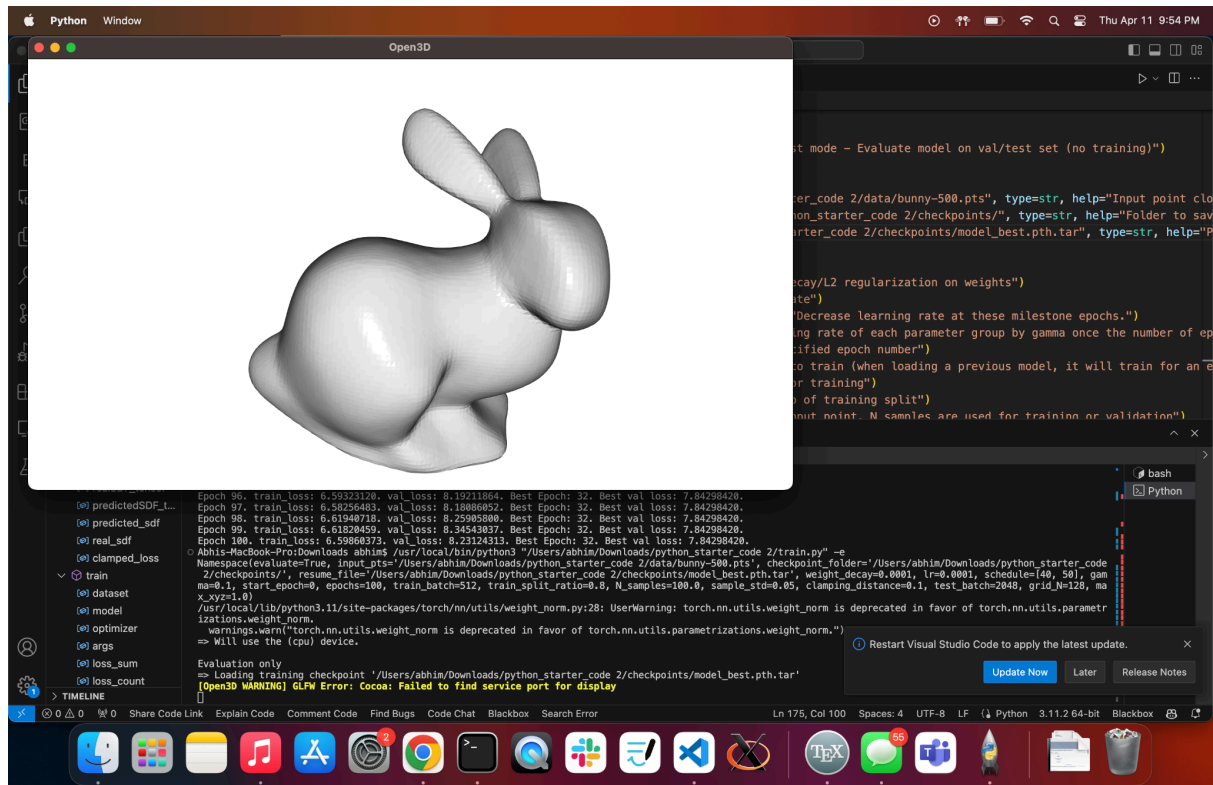
```
Python Window
Open3D
[Open3D WARNING] GLFW Error: Cocoa: Failed to find service port for display
```

TERMINAL

```
Epoch 99. train_loss: 6.28383398, val_loss: 14.08825596, Best Epoch: 10, Best val loss: 9.13192881.
Epoch 100. train_loss: 6.24807511, val_loss: 13.51855469, Best Epoch: 10, Best val loss: 9.13192881.
Abhis-MacBook-Pro:Downloads abhinava$ /usr/local/bin/python3 "/Users/abhinava/Downloads/python_starter_code 2/train.py" -e
Namespace(evaluate=True, input_pts="/Users/abhinava/Downloads/python_starter_code 2/data/sphere.pts", checkpoint_folder="/Users/abhinava/Downloads/python_starter_code 2/checkpoints/", resume_file="/Users/abhinava/Downloads/python_starter_code 2/checkpoints/model_best.pth.tar", weight_decay=0.0001, lr=0.0001, schedule=[40, 50], gamma=0.1, start_epoch=0, epochs=100, train_batch=512, train_split_ratio=0.8, N_samples=100.0, sample_std=0.05, clamping_distance=0.1, test_batch=2848, grid_N=128, max_xyz=1.0)
/usr/local/lib/python3.11/site-packages/torch/nn/utils/weight_norm.py:28: UserWarning: torch.nn.utils.weight_norm is deprecated in favor of torch.nn.utils.parametrize.weight_norm.
warnings.warn("torch.nn.utils.weight_norm is deprecated in favor of torch.nn.utils.parametrize.weight_norm.")
=> Will use the (cpu) device.

Evaluation only
=> Loading training checkpoint '/Users/abhinava/Downloads/python_starter_code 2/checkpoints/model_best.pth.tar'
```

Reconstructed bunny-500pts:



Reconstructed bunny-1000pts:

