

```

Training Layer fc1 : End
Training Layer out : Begin
100%|██████████| 1/1 [00:09<00:00, 9.11s/it]
  0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
2.8967242781072855
Training Layer out : End
Model Constructed
Data Loaded
100%|██████████| 1/1 [00:09<00:00, 9.39s/it]
  0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
3.2527508176863194
100%|██████████| 1/1 [00:09<00:00, 9.30s/it]For epoch 0 MSE
loss is 2.495891885831952
Model Constructed

```

```

epoch 0 total correct: tensor(48518)    0.6793451411028703
epoch 0 total correct: tensor(46860)    0.7390447353323301

```

```

epoch 1 total correct: tensor(54774)    0.29998173664013544
epoch 1 total correct: tensor(54893)    0.2961347907781601

```

```

epoch 2 total correct: tensor(55601)    0.2541995863119761
epoch 2 total correct: tensor(55673)    0.25001681099335354

```

```

epoch 3 total correct: tensor(56168)    0.22471109554171562
epoch 3 total correct: tensor(56095)    0.22266267649829388

```

```

epoch 4 total correct: tensor(56493)    0.2041838911672433
epoch 4 total correct: tensor(56475)    0.20272985361516477

```

```

In [87]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')
  0%|          | 0/1 [00:00<?, ?it/s]Reloaded modules: Network

```

```

Data Loaded
Constructing DAE Initialized NN
Training Layer fc1 : Begin
100%|██████████| 1/1 [00:09<00:00, 9.69s/it]
  0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
3.1097733452916145
Training Layer fc1 : End
Training Layer out : Begin
100%|██████████| 1/1 [00:10<00:00, 10.17s/it]

```

```

0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
2.5217839032411575
Training Layer out : End
Model Constructed
Data Loaded
Constructing Random Initialized NN
100%|██████████| 1/1 [00:09<00:00, 9.69s/it]
0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
3.6696501411497593
100%|██████████| 1/1 [00:09<00:00, 9.30s/it]For epoch 0 MSE
loss is 1.5617166459560394
Model Constructed

```

```

epoch 0 total correct: tensor(47257) 0.6969112858176232
epoch 0 total correct: tensor(46494) 0.7636562392115593

```

```

epoch 1 total correct: tensor(54983) 0.2930372896293799
epoch 1 total correct: tensor(54468) 0.32525608912110326

```

```

epoch 2 total correct: tensor(55737) 0.2521627478301525
epoch 2 total correct: tensor(55053) 0.2861586990455786

```

Traceback (most recent call last):

```

File "<ipython-input-87-68b82dadd473>", line 1, in <module>
    runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')

```

```

File "//anaconda3/lib/python3.7/site-packages/
spyder_kernels/customize/spydercustomize.py", line 827, in
runfile
    execfile(filename, namespace)

```

```

File "//anaconda3/lib/python3.7/site-packages/
spyder_kernels/customize/spydercustomize.py", line 110, in
execfile
    exec(compile(f.read(), filename, 'exec'), namespace)

```

```

File "/Users/jayasaharan/Documents/Mini 1/Machine Learning
701/Project/TestNetwork.py", line 134, in <module>
    train_test(model_init,model_random,train_set)

```

```

File "/Users/jayasaharan/Documents/Mini 1/Machine Learning
701/Project/TestNetwork.py", line 101, in train_test
    for batch in train_loader:

```

```
File "//anaconda3/lib/python3.7/site-packages/torch/utils/
data/dataloader.py", line 346, in __next__
    data = self._dataset_fetcher.fetch(index) # may raise
StopIteration
```

```
File "//anaconda3/lib/python3.7/site-packages/torch/utils/
data/_utils/fetch.py", line 44, in fetch
    data = [self.dataset[idx] for idx in
possibly_batched_index]
```

```
File "//anaconda3/lib/python3.7/site-packages/torch/utils/
data/_utils/fetch.py", line 44, in <listcomp>
    data = [self.dataset[idx] for idx in
possibly_batched_index]
```

```
File "//anaconda3/lib/python3.7/site-packages/torchvision/
datasets/mnist.py", line 95, in __getitem__
    img = self.transform(img)
```

```
File "//anaconda3/lib/python3.7/site-packages/torchvision/
transforms/transforms.py", line 70, in __call__
    img = t(img)
```

```
File "//anaconda3/lib/python3.7/site-packages/torchvision/
transforms/transforms.py", line 101, in __call__
    return F.to_tensor(pic)
```

```
File "//anaconda3/lib/python3.7/site-packages/torchvision/
transforms/functional.py", line 97, in to_tensor
    img = img.transpose(0, 1).transpose(0, 2).contiguous()
```

KeyboardInterrupt

In [88]:

```
In [88]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')
[autoreload of Network failed: Traceback (most recent call
last):
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 245, in check
    superreload(m, reload, self.old_objects)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 450, in superreload
    update_generic(old_obj, new_obj)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
```

```

extensions/autoreload.py", line 387, in update_generic
    update(a, b)
  File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 357, in update_class
    update_instances(old, new)
  File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 312, in update_instances
    update_instances(old, new, obj.__dict__, visited)
  File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
  File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
  File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
  File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 300, in update_instances
    for obj in (obj for obj in objects if id(obj) not in
visited):
  File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 300, in <genexpr>
    for obj in (obj for obj in objects if id(obj) not in
visited):
KeyboardInterrupt
]
  0%|          | 0/1 [00:00<?, ?it/s]Reloaded modules: Network
Data Loaded
Constructing DAE Initialized NN
Training Layer fc1 : Begin
100%|██████████| 1/1 [00:10<00:00, 10.19s/it]
  0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
3.3470727279782295
Training Layer fc1 : End
Training Layer out : Begin
100%|██████████| 1/1 [00:09<00:00, 9.30s/it]For epoch 0 MSE
loss is 2.3525539338588715
Training Layer out : End
Model Constructed
Data Loaded
Constructing Random Initialized NN

Model Constructed
epoch 0 total correct: tensor(46447)    0.7692270514865717
epoch 0 total correct: tensor(52189)    0.45782097478707634

epoch 1 total correct: tensor(55297)    0.27590862040718395

```

epoch 1 total correct: tensor(56645) 0.1914811412493388

epoch 2 total correct: tensor(56012) 0.23293584796289604

epoch 2 total correct: tensor(57667) 0.1333646093805631

epoch 3 total correct: tensor(56334) 0.2127623793979486

epoch 3 total correct: tensor(58186) 0.10204411279410124

epoch 4 total correct: tensor(56550) 0.19924905536075432

epoch 4 total correct: tensor(58442) 0.08519152204195658

```
In [89]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')
```

```
0%|          | 0/1 [00:00<?, ?it/s]Reloaded modules: Network
Data Loaded
```

```
Constructing DAE Initialized NN
```

```
Training Layer fc1 : Begin
```

```
100%|██████████| 1/1 [00:09<00:00, 9.53s/it]
```

```
0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
3.274661857634783
```

```
Training Layer fc1 : End
```

```
Training Layer out : Begin
```

```
100%|██████████| 1/1 [00:09<00:00, 9.19s/it]For epoch 0 MSE
loss is 2.3078593853861094
```

```
Training Layer out : End
```

```
Model Constructed
```

```
Data Loaded
```

```
Constructing Random Initialized NN
```

```
Model Constructed
```

epoch 0 total correct: tensor(47583) 0.7059959997733434

epoch 0 total correct: tensor(52239) 0.4519306518137455

epoch 1 total correct: tensor(55032) 0.2879567546149095

epoch 1 total correct: tensor(56717) 0.18927593268454074

epoch 2 total correct: tensor(55722) 0.2488804077108701

epoch 2 total correct: tensor(57645) 0.1332613522807757

epoch 3 total correct: tensor(56201) 0.22218861108024915

epoch 3 total correct: tensor(58136) 0.10414924453943968

epoch 4 total correct: tensor(56516) 0.2033392358571291

epoch 4 total correct: tensor(58565) 0.08101218982289235

```
In [90]: temp = torch.tensor([1,2,3,4,5])
```

```
In [91]: temp
```

```
Out[91]: tensor([1, 2, 3, 4, 5])
```

```
In [92]: tensor[0] = 100
```

```
Traceback (most recent call last):
```

```
File "<ipython-input-92-9e1fb7a9e749>", line 1, in <module>
    tensor[0] = 100
```

```
NameError: name 'tensor' is not defined
```

```
In [93]:
```

```
In [93]: temp[0] = 100
```

```
In [94]: temp
```

```
Out[94]: tensor([100,  2,  3,  4,  5])
```

```
In [95]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/Network.py', wdir='/Users/jayasaharan/
Documents/Mini 1/Machine Learning 701/Project')
```

```
Reloaded modules: Network
```

```
[autoreload of Network failed: Traceback (most recent call
last):
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 245, in check
    superreload(m, reload, self.old_objects)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 450, in superreload
    update_generic(old_obj, new_obj)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 387, in update_generic
    update(a, b)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 357, in update_class
    update_instances(old, new)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 312, in update_instances
```

```

        update_instances(old, new, obj.__dict__, visited)
    File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
        update_instances(old, new, obj, visited)
    File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
        update_instances(old, new, obj, visited)
    File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
        update_instances(old, new, obj, visited)
    [Previous line repeated 1 more time]
    File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 300, in update_instances
        for obj in (obj for obj in objects if id(obj) not in
visited):
KeyboardInterrupt
]

```

```

In [96]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/Network.py', wdir='/Users/jayasaharan/
Documents/Mini 1/Machine Learning 701/Project')

```

```

In [97]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')
0%|          | 0/1 [00:00<?, ?it/s]Data Loaded
Constructing DAE Initialized NN
Training Layer fc1 : Begin

```

Traceback (most recent call last):

```

File "<ipython-input-97-68b82dadd473>", line 1, in <module>
    runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')

```

```

File "//anaconda3/lib/python3.7/site-packages/
spyder_kernels/customize/spydercustomize.py", line 827, in
runfile
    execfile(filename, namespace)

```

```

File "//anaconda3/lib/python3.7/site-packages/
spyder_kernels/customize/spydercustomize.py", line 110, in
execfile
    exec(compile(f.read(), filename, 'exec'), namespace)

```

```

File "/Users/jayasaharan/Documents/Mini 1/Machine Learning
701/Project/TestNetwork.py", line 131, in <module>
    model_init =

```

```
construct_model(layer_params_2,train_set,True)
```

```
File "/Users/jayasaharan/Documents/Mini 1/Machine Learning
701/Project/TestNetwork.py", line 80, in construct_model
```

```
model = DAE_NN.construct(layer_params,train_loader)
```

```
File "/Users/jayasaharan/Documents/Mini 1/Machine Learning
701/Project/Network.py", line 166, in construct
```

```
init_layer, next_transformer, init_loss =
Autoencoder.get_linear_layer(dataloader,l['out_features'],l['t
ransformer'],feature_transformer=next_transformer)
```

```
File "/Users/jayasaharan/Documents/Mini 1/Machine Learning
701/Project/Network.py", line 78, in get_linear_layer
```

```
total_loss =
Autoencoder.train(model,loss_func,optimizer,epoch,dataloader,f
eature_transformer)
```

```
File "/Users/jayasaharan/Documents/Mini 1/Machine Learning
701/Project/Network.py", line 92, in train
```

```
noisy_X = Autoencoder.add_noise(feature_transformer(X))
```

```
File "/Users/jayasaharan/Documents/Mini 1/Machine Learning
701/Project/Network.py", line 43, in add_noise
```

```
return
X*torch.tensor(np.random.choice([0,1],size=X.shape),replace=Tr
ue, p=[0.3,0.7])
```

```
TypeError: tensor() got an unexpected keyword argument
'replace'
```

In [98]:

```
In [98]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/Network.py', wdir='/Users/jayasaharan/
Documents/Mini 1/Machine Learning 701/Project')
```

Reloaded modules: Network

[autoreload of Network failed: Traceback (most recent call last):

File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 245, in check

superreload(m, reload, self.old_objects)

File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 450, in superreload

update_generic(old_obj, new_obj)

File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 387, in update_generic

update(a, b)


```

File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 357, in update_class
    update_instances(old, new)
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 312, in update_instances
    update_instances(old, new, obj.__dict__, visited)
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 300, in update_instances
    for obj in (obj for obj in objects if id(obj) not in
visited):
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 300, in <genexpr>
    for obj in (obj for obj in objects if id(obj) not in
visited):
KeyboardInterrupt
]

```

```

In [99]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/Network.py', wdir='/Users/jayasaharan/
Documents/Mini 1/Machine Learning 701/Project')

```

```

In [100]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')

```

```

0%|          | 0/1 [00:00<?, ?it/s]Data Loaded
Constructing DAE Initialized NN
Training Layer fc1 : Begin
100%|██████████| 1/1 [00:11<00:00, 11.11s/it]
0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
2.894030600786209
Training Layer fc1 : End
Training Layer out : Begin
100%|██████████| 1/1 [00:09<00:00, 9.47s/it]For epoch 0 MSE
loss is 5.088269520550966
Training Layer out : End
Model Constructed
Data Loaded
Constructing Random Initialized NN

```

```

Model Constructed

```

```
epoch 0 total correct: tensor(43024) 0.8879849083721638
epoch 0 total correct: tensor(52079) 0.4561086893081665
```

```
epoch 1 total correct: tensor(54495) 0.3222374901175499
epoch 1 total correct: tensor(56601) 0.19623003875215847
```

```
epoch 2 total correct: tensor(55377) 0.27318408638238906
epoch 2 total correct: tensor(57472) 0.14216609025994936
```

```
epoch 3 total correct: tensor(55996) 0.23809117550651232
epoch 3 total correct: tensor(58036) 0.10924746071298917
```

```
epoch 4 total correct: tensor(56425) 0.21398483105003835
epoch 4 total correct: tensor(58399) 0.08990852373341719
```

```
In [101]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')
```

```
0%|          | 0/1 [00:00<?, ?it/s]Reloaded modules: Network
```

```
Data Loaded
```

```
Constructing DAE Initialized NN
```

```
Training Layer fc1 : Begin
```

```
100%|██████████| 1/1 [00:13<00:00, 13.07s/it]
```

```
0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
5.835094217211008
```

```
Training Layer fc1 : End
```

```
Training Layer fc2 : Begin
```

```
100%|██████████| 1/1 [00:14<00:00, 14.31s/it]
```

```
0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
0.2913283389643766
```

```
Training Layer fc2 : End
```

```
Training Layer fc3 : Begin
```

```
100%|██████████| 1/1 [00:15<00:00, 15.76s/it]
```

```
0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
0.04212693289082381
```

```
Training Layer fc3 : End
```

```
Training Layer fc4 : Begin
```

```
100%|██████████| 1/1 [00:15<00:00, 15.14s/it]
```

```
0%|          | 0/1 [00:00<?, ?it/s]For epoch 0 MSE loss is
0.016213976483413717
```

```
Training Layer fc4 : End
```

```
Training Layer out : Begin
```

```
100%|██████████| 1/1 [00:14<00:00, 14.73s/it]For epoch 0 MSE
```

```
loss is 0.20564927336818073
Training Layer out : End
Model Constructed
Data Loaded
Constructing Random Initialized NN
```

```
Model Constructed
epoch 0 total correct: tensor(14001) 1.9658735891183217
epoch 0 total correct: tensor(48769) 0.5652145709842443

epoch 1 total correct: tensor(19416) 1.7345570305983224
epoch 1 total correct: tensor(57558) 0.1377851128578186

epoch 2 total correct: tensor(20880) 1.6851088921229045
epoch 2 total correct: tensor(58301) 0.09537508618086576

epoch 3 total correct: tensor(21677) 1.6515324632326762
epoch 3 total correct: tensor(58508) 0.08326454441994428

epoch 4 total correct: tensor(21732) 1.631039442618688
epoch 4 total correct: tensor(58831) 0.06398380886142453
```

```
In [102]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/Network.py', wdir='/Users/jayasaharan/
Documents/Mini 1/Machine Learning 701/Project')
```

```
Reloaded modules: Network
```

```
[autoreload of Network failed: Traceback (most recent call
last):
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 245, in check
```

```
    superreload(m, reload, self.old_objects)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 450, in superreload
```

```
    update_generic(old_obj, new_obj)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 387, in update_generic
```

```
    update(a, b)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 357, in update_class
```

```
    update_instances(old, new)
```

```
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 312, in update_instances
```

```
    update_instances(old, new, obj.__dict__, visited)
```

```

File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 317, in update_instances
    update_instances(old, new, obj, visited)
File "//anaconda3/lib/python3.7/site-packages/IPython/
extensions/autoreload.py", line 302, in update_instances
    visited.update({id(obj):obj})
KeyboardInterrupt
]

```

```

In [103]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/Network.py', wdir='/Users/jayasaharan/
Documents/Mini 1/Machine Learning 701/Project')

```

```

In [104]: runfile('/Users/jayasaharan/Documents/Mini 1/Machine
Learning 701/Project/TestNetwork.py', wdir='/Users/
jayasaharan/Documents/Mini 1/Machine Learning 701/Project')

```

```

0%|          | 0/5 [00:00<?, ?it/s]Data Loaded
Constructing DAE Initialized NN
Training Layer fc1 : Begin
20%|█         | 1/5 [00:13<00:52, 13.02s/it]For epoch 0 MSE
loss is 5.430791564285755
40%|██        | 2/5 [00:26<00:39, 13.02s/it]For epoch 1 MSE
loss is 3.552666876465082
60%|████      | 3/5 [00:39<00:26, 13.04s/it]For epoch 2 MSE
loss is 3.4692995473742485
80%|██████    | 4/5 [00:52<00:13, 13.07s/it]For epoch 3 MSE
loss is 3.441134210675955
100%|████████| 5/5 [01:05<00:00, 13.05s/it]
0%|          | 0/5 [00:00<?, ?it/s]For epoch 4 MSE loss is
3.4250826574862003
Training Layer fc1 : End
Training Layer fc2 : Begin
20%|█         | 1/5 [00:14<00:57, 14.35s/it]For epoch 0 MSE
loss is 0.42016948375385255
40%|██        | 2/5 [00:28<00:42, 14.32s/it]For epoch 1 MSE
loss is 0.1159059206256643
60%|████      | 3/5 [00:42<00:28, 14.31s/it]For epoch 2 MSE
loss is 0.10903470043558627
80%|██████    | 4/5 [00:57<00:14, 14.31s/it]For epoch 3 MSE
loss is 0.10607037774752825
100%|████████| 5/5 [01:11<00:00, 14.31s/it]
0%|          | 0/5 [00:00<?, ?it/s]For epoch 4 MSE loss is
0.10620622057467699

```

```

Training Layer fc2 : End
Training Layer fc3 : Begin
 20%|██████| 1/5 [00:15<01:02, 15.73s/it]For epoch 0 MSE
loss is 0.05114564814721234
 40%|██████| 2/5 [00:31<00:47, 15.74s/it]For epoch 1 MSE
loss is 0.006033474201103672
 60%|██████| 3/5 [00:47<00:31, 15.76s/it]For epoch 2 MSE
loss is 0.005560845820582472
 80%|██████| 4/5 [01:02<00:15, 15.72s/it]For epoch 3 MSE
loss is 0.0048853356565814465
100%|██████| 5/5 [01:18<00:00, 15.70s/it]
 0%|██████| 0/5 [00:00<?, ?it/s]For epoch 4 MSE loss is
0.004221547318593366
Training Layer fc3 : End
Training Layer fc4 : Begin
 20%|██████| 1/5 [00:15<01:00, 15.14s/it]For epoch 0 MSE
loss is 0.0431548052438302
 40%|██████| 2/5 [00:30<00:45, 15.14s/it]For epoch 1 MSE
loss is 0.008252355495642405
 60%|██████| 3/5 [00:45<00:30, 15.15s/it]For epoch 2 MSE
loss is 0.007362100099271629
 80%|██████| 4/5 [01:02<00:15, 15.61s/it]For epoch 3 MSE
loss is 0.0054181173763936386
100%|██████| 5/5 [01:20<00:00, 16.46s/it]
 0%|██████| 0/5 [00:00<?, ?it/s]For epoch 4 MSE loss is
0.0040945912078313995
Training Layer fc4 : End
Training Layer out : Begin
 20%|██████| 1/5 [00:15<01:03, 15.93s/it]For epoch 0 MSE
loss is 0.2378869855310768
 40%|██████| 2/5 [00:31<00:47, 15.85s/it]For epoch 1 MSE
loss is 0.016758889556513168
 60%|██████| 3/5 [00:46<00:31, 15.58s/it]For epoch 2 MSE
loss is 0.008527091828000266
 80%|██████| 4/5 [01:01<00:15, 15.37s/it]For epoch 3 MSE
loss is 0.008283547787868883
100%|██████| 5/5 [01:16<00:00, 15.21s/it]For epoch 4 MSE
loss is 0.00831675536755938
Training Layer out : End
Model Constructed
Data Loaded
Constructing Random Initialized NN

```

```

Model Constructed
epoch 0 total correct: tensor(23188) 1.5906173666318257
epoch 0 total correct: tensor(47277) 0.6377738726635774

```

```

epoch 1 total correct: tensor(32795) 1.1726323972145716

```

epoch 1 total correct: tensor(57375) 0.14858715645968915

epoch 2 total correct: tensor(35572) 1.0848045945167542
epoch 2 total correct: tensor(58235) 0.10162085772802433

epoch 3 total correct: tensor(37209) 1.0410857866207759
epoch 3 total correct: tensor(58582) 0.07920444744328657

epoch 4 total correct: tensor(38338) 1.0122268557548524
epoch 4 total correct: tensor(58794) 0.06630601026117802

In [105]: