

21BAI1533 Zeel Mehta

Multi-Layer Perceptron Neural Network Models Using Keras

```
In [1]: import numpy as np
import tensorflow as tf
```

```
In [2]: from keras.layers import Dense
from keras.models import Sequential
from keras.optimizers import SGD
```

```
In [3]: x=np.array([[0,0],[0,1],[1,0],[1,1]])
```

```
In [4]: y=np.array([[0],[1],[1],[0]])
```

```
In [5]: model=Sequential()
```

Metal device set to: Apple M1

2023-06-17 11:24:28.173197: I tensorflow/core/common_runtime/pluggable_device/pluggable_device_factory.cc:306] Could not identify NUMA node of platform GPU ID 0, defaulting to 0. Your kernel may not have been built with NUMA support.

2023-06-17 11:24:28.173462: I tensorflow/core/common_runtime/pluggable_device/pluggable_device_factory.cc:272] Created TensorFlow device (/job:localhost/replica:0/task:0/device:GPU:0 with 0 MB memory) -> physical PluggableDevice (device: 0, name: METAL, pci bus id : <undefined>)

```
In [6]: model.add(Dense(8,input_dim=2,activation='relu'))
model.add(Dense(1, activation='sigmoid'))
```

```
In [7]: model.compile(loss='mse', optimizer='adam')
```

```
In [8]: model.fit(x,y,epochs=5000,batch_size=4)
```

Epoch 1/5000

2023-06-17 11:24:28.374461: W tensorflow/core/platform/profile_utils/cpu_utils.cc:128] Failed to get CPU frequency: 0 Hz

2023-06-17 11:24:28.474979: I tensorflow/core/grappler/optimizers/custom_graph_optimizer_registry.cc:114] Plugin optimizer for device_type GPU is enabled.

1/1 [=====] - 0s 213ms/step - loss: 0.2396

Epoch 2/5000

1/1 [=====] - 0s 7ms/step - loss: 0.2393

Epoch 3/5000

1/1 [=====] - 0s 4ms/step - loss: 0.2390

Epoch 4/5000

1/1 [=====] - 0s 5ms/step - loss: 0.2386

Epoch 5/5000

1/1 [=====] - 0s 5ms/step - loss: 0.2383

Epoch 6/5000

1/1 [=====] - 0s 5ms/step - loss: 0.2380

```
In [10]: print(model.predict(x))
```

1/1 [=====] - 0s 129ms/step

[[0.05045255]

[0.98467433]

[0.98418695]

[0.05045069]]

2023-06-17 11:25:40.670546: I tensorflow/core/grappler/optimizers/custom_graph_optimizer_registry.cc:114] Plugin optimizer for device_type GPU is enabled.

```
In [ ]:
```