

## ▼ IBM cloud deployment

Team ID - PNT2022TMID07039

## ▼ Importing the required libraries

```
!pip install tensorflow --upgrade
```

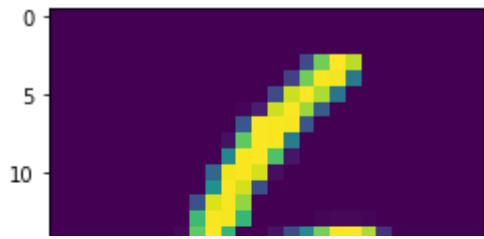
```
Requirement already satisfied: tensorflow in /opt/conda/envs/Python-3.9/lib/python
Collecting tensorflow
  Downloading tensorflow-2.10.0-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_
  |██████████████████████████████████████████████████████████████████████████| 578.1 MB 40 kB/s /s eta 0:00:01B 15.2 MB/s
Requirement already satisfied: termcolor>=1.1.0 in /opt/conda/envs/Python-3.9/lib/
Requirement already satisfied: flatbuffers>=2.0 in /opt/conda/envs/Python-3.9/lib/
Requirement already satisfied: gast<=0.4.0,>=0.2.1 in /opt/conda/envs/Python-3.9/l
Requirement already satisfied: keras-preprocessing>=1.1.1 in /opt/conda/envs/Pytho
Requirement already satisfied: numpy>=1.20 in /opt/conda/envs/Python-3.9/lib/pytho
Requirement already satisfied: grpcio<2.0,>=1.24.3 in /opt/conda/envs/Python-3.9/l
Collecting absl-py>=1.0.0
  Downloading absl_py-1.3.0-py3-none-any.whl (124 kB)
  |██████████████████████████████████████████████████████████████████████████| 124 kB 83.1 MB/s eta 0:00:01
Requirement already satisfied: astunparse>=1.6.0 in /opt/conda/envs/Python-3.9/lib
Requirement already satisfied: six>=1.12.0 in /opt/conda/envs/Python-3.9/lib/pytho
Requirement already satisfied: tensorflow-io-gcs-filesystem>=0.23.1 in /opt/conda/
Collecting keras<2.11,>=2.10.0
  Downloading keras-2.10.0-py2.py3-none-any.whl (1.7 MB)
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Requirement already satisfied: opt-einsum>=2.3.2 in /opt/conda/envs/Python-3.9/lib
Requirement already satisfied: setuptools in /opt/conda/envs/Python-3.9/lib/python
Requirement already satisfied: packaging in /opt/conda/envs/Python-3.9/lib/python3
Requirement already satisfied: typing-extensions>=3.6.6 in /opt/conda/envs/Python-
Requirement already satisfied: google-pasta>=0.1.1 in /opt/conda/envs/Python-3.9/l
Requirement already satisfied: protobuf<3.20,>=3.9.2 in /opt/conda/envs/Python-3.9
Requirement already satisfied: h5py>=2.9.0 in /opt/conda/envs/Python-3.9/lib/pytho
Collecting tensorflow-estimator<2.11,>=2.10.0
  Downloading tensorflow_estimator-2.10.0-py2.py3-none-any.whl (438 kB)
  |██████████████████████████████████████████████████████████████████████████| 438 kB 83.2 MB/s eta 0:00:01
Requirement already satisfied: wrapt>=1.11.0 in /opt/conda/envs/Python-3.9/lib/pyt
Requirement already satisfied: wheel<1.0,>=0.23.0 in /opt/conda/envs/Python-3.9/li
Requirement already satisfied: google-auth<3,>=1.6.3 in /opt/conda/envs/Python-3.9
Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in /opt/conda/envs
Requirement already satisfied: tensorboard-data-server<0.7.0,>=0.6.0 in /opt/conda
Requirement already satisfied: requests<3,>=2.21.0 in /opt/conda/envs/Python-3.9/l
Requirement already satisfied: markdown>=2.6.8 in /opt/conda/envs/Python-3.9/lib/p
Requirement already satisfied: tensorboard-plugin-wit>=1.6.0 in /opt/conda/envs/Py
```



```
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  0, 0],
[ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 39,
```

```
plt.imshow(x_train[6000]) #ploting the index=image
```

<matplotlib.image.AxesImage at 0x7f0004821880>



```
np.argmax(y_train[6000])
```

0



## ▼ Reshaping Dataset

```
#Reshaping to format which CNN expects (batch, height, width, channels)
x_train=x_train.reshape (60000, 28, 28, 1).astype('float32')
x_test=x_test.reshape (10000, 28, 28, 1).astype ('float32')
```

## ▼ Applying One Hot Encoding

```
number_of_classes = 10 #storing the no of classes in a variable
```

```
y_train = np_utils.to_categorical (y_train, number_of_classes) #converts the output in bin
y_test = np_utils.to_categorical (y_test, number_of_classes)
```

## ▶ Add CNN Layers

```
[ ] ↳ 4 cells hidden
```

## ▶ Compiling the model

```
[ ] ↳ 2 cells hidden
```

## ▶ Train the model

```
[ ] ↳ 1 cell hidden
```

## ▶ Observing the metrics

[ ] ↳ 1 cell hidden

## ▶ Test The Model

[ ] ↳ 4 cells hidden

## ▶ Save The model

[ ] ↳ 4 cells hidden

## ▶ Cloud deploy

[ ] ↳ 12 cells hidden

## ▶ TEST MODEL

[ ] ↳ 8 cells hidden