

Assignment 3

Problem statement

Build the Image classification model

Details

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3. Division : BE 10
4. Batch : R-10
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6. Course : Laboratory Practice 4 (Deep Learning)

```
#importing the libraries
import matplotlib.pyplot as plt
import tensorflow as tf
from tensorflow.keras import datasets, layers, models

#grabbing CIFAR10 dataset
(train_images, train_labels), (test_images, test_labels) = datasets.cifar10.load_data()
train_images, test_images = train_images / 255.0, test_images / 255.0

Downloading data from https://www.cs.toronto.edu/~kriz/cifar-10-python.tar.gz
170498071/170498071 [=====] - 4s 0us/step

#showing images of mentioned categories
class_names = ['airplane', 'automobile', 'bird', 'cat', 'deer', 'dog', 'frog', 'horse', 'ship', 'truck']

plt.figure(figsize=(10,10))
for i in range(10):
    plt.subplot(5,5,i+1)
    plt.xticks([])
    plt.yticks([])
    plt.grid(False)
    plt.imshow(train_images[i])
    plt.xlabel(class_names[train_labels[i][0]])
plt.show()
```



frog



truck



truck



deer



automobile

```
#building CNN model
```

```
model = models.Sequential()
model.add(layers.Conv2D(32, (3, 3), activation='relu', input_shape=(32, 32, 3)))
model.add(layers.MaxPooling2D((2, 2)))
model.add(layers.Conv2D(64, (3, 3), activation='relu'))
model.add(layers.MaxPooling2D((2, 2)))
model.add(layers.Conv2D(64, (3, 3), activation='relu'))
model.add(layers.Flatten())
model.add(layers.Dense(64, activation='relu'))
model.add(layers.Dense(10))
```

```
model.summary()
```

Model: "sequential"

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 30, 30, 32)	896
max_pooling2d (MaxPooling2D)	(None, 15, 15, 32)	0
conv2d_1 (Conv2D)	(None, 13, 13, 64)	18496
max_pooling2d_1 (MaxPooling2D)	(None, 6, 6, 64)	0
conv2d_2 (Conv2D)	(None, 4, 4, 64)	36928
flatten (Flatten)	(None, 1024)	0
dense (Dense)	(None, 64)	65600
dense_1 (Dense)	(None, 10)	650
Total params: 122,570		
Trainable params: 122,570		
Non-trainable params: 0		

```
#model compilation
```

```
model.compile(optimizer='adam', loss=tf.keras.losses.SparseCategoricalCrossentropy(
epochs = 1
```

```
h = model.fit(train_images, train_labels, epochs=epochs, validation_data=(test_images,
```

```
1563/1563 [=====] - 86s 54ms/step - loss: 1.5369 - a
```

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