Assignment 3: Build the Image classification model

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In [ ]: #Tushar Kokane
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In [9]: #importing the libraries
        import matplotlib.pyplot as plt
        import tensorflow as tf
        from tensorflow.keras import datasets, layers, models
```

```
In [12]: #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
```

```
In [13]: #showing images of mentioned categories
         class_names = ['airplane', 'automobile', 'bird', 'cat', 'deer','dog', 'frog', 'horse', 'ship', 'tru

         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()
```

In [14]:
```
#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()
```

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Model: "sequential_2"
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 Layer (type)                Output Shape              Param #
=================================================================
 conv2d_6 (Conv2D)           (None, 30, 30, 32)        896

 max_pooling2d_4 (MaxPoolin  (None, 15, 15, 32)        0
 g2D)

 conv2d_7 (Conv2D)           (None, 13, 13, 64)        18496

 max_pooling2d_5 (MaxPoolin  (None, 6, 6, 64)          0
 g2D)

 conv2d_8 (Conv2D)           (None, 4, 4, 64)          36928

 flatten_2 (Flatten)         (None, 1024)              0

 dense_4 (Dense)             (None, 64)                65600

 dense_5 (Dense)             (None, 10)                650

=================================================================
Total params: 122570 (478.79 KB)
Trainable params: 122570 (478.79 KB)
Non-trainable params: 0 (0.00 Byte)
_________________________________________________________________
```

In [15]:
```
#model compilation
model.compile(optimizer='adam',loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True)
epochs = 1
h = model.fit(train_images, train_labels, epochs=epochs, validation_data=(test_images, test_labels)
```

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1563/1563 [==============================] - 78s 49ms/step - loss: 1.4723 - accuracy: 0.4640 - val
_loss: 1.1811 - val_accuracy: 0.5826
```

In [ ]:

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