EXPERIMENT 3

```
Downloading data from https://www.cs.toronto.edu/~kriz/cifar-10-python.tar.gz
170498071/170498071 ━━━━━━━━━━━━━━━━━━━━ 4s 0us/step
Training data shape: (50000, 32, 32, 3)
Testing data shape: (10000, 32, 32, 3)
/tmp/ipython-input-3562023477.py:22: DeprecationWarning: Conversion of an array with ndim > 0 to a scalar is deprecated, and will error in future. Ensure you extra
  plt.title(class_names[int(y_train[i])])
```


```
/usr/local/lib/python3.12/dist-packages/keras/src/layers/convolutional/base_conv.py:113: UserWarning: Do not pass an `input_shape`/`input_dim` argument to a layer.
  super().__init__(activity_regularizer=activity_regularizer, **kwargs)
Model: "sequential"
```

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 32, 32, 32)	896
max_pooling2d (MaxPooling2D)	(None, 16, 16, 32)	0
conv2d_1 (Conv2D)	(None, 16, 16, 64)	18,496
max_pooling2d_1 (MaxPooling2D)	(None, 8, 8, 64)	0
max_pooling2d_1 (MaxPooling2D)	(None, 8, 8, 64)	0
conv2d_2 (Conv2D)	(None, 8, 8, 128)	73,856
max_pooling2d_2 (MaxPooling2D)	(None, 4, 4, 128)	0
flatten (Flatten)	(None, 2048)	0
dense (Dense)	(None, 128)	262,272
dropout (Dropout)	(None, 128)	0
dense_1 (Dense)	(None, 10)	1,290

```
 Total params: 356,810 (1.36 MB)
 Trainable params: 356,810 (1.36 MB)
 Non-trainable params: 0 (0.00 B)
Epoch 1/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 111s 139ms/step - accuracy: 0.3200 - loss: 1.8397 - val_accuracy: 0.5391 - val_loss: 1.2878
Epoch 2/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 139s 136ms/step - accuracy: 0.5309 - loss: 1.3165 - val_accuracy: 0.6295 - val_loss: 1.0834
Epoch 3/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 109s 139ms/step - accuracy: 0.6062 - loss: 1.1187 - val_accuracy: 0.6742 - val_loss: 0.9176
Epoch 4/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 107s 136ms/step - accuracy: 0.6603 - loss: 0.9751 - val_accuracy: 0.7066 - val_loss: 0.8459
Epoch 5/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 106s 136ms/step - accuracy: 0.6949 - loss: 0.8814 - val_accuracy: 0.7172 - val_loss: 0.8090
Epoch 6/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 108s 138ms/step - accuracy: 0.7216 - loss: 0.7975 - val_accuracy: 0.7360 - val_loss: 0.7663
Epoch 7/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 141s 136ms/step - accuracy: 0.7445 - loss: 0.7442 - val_accuracy: 0.7453 - val_loss: 0.7497
Epoch 8/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 107s 137ms/step - accuracy: 0.7629 - loss: 0.6849 - val_accuracy: 0.7554 - val_loss: 0.7205
Epoch 9/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 106s 135ms/step - accuracy: 0.7818 - loss: 0.6281 - val_accuracy: 0.7557 - val_loss: 0.7289
Epoch 10/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 106s 136ms/step - accuracy: 0.7922 - loss: 0.5946 - val_accuracy: 0.7438 - val_loss: 0.7779
Test Accuracy: 74.38%
Test Loss: 0.7779
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 130ms/step
```

```
Epoch 4/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 107s 136ms/step - accuracy: 0.6603 - loss: 0.9751 - val_accuracy: 0.7066 - val_loss: 0.8459
Epoch 5/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 106s 136ms/step - accuracy: 0.6949 - loss: 0.8814 - val_accuracy: 0.7172 - val_loss: 0.8090
Epoch 6/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 108s 138ms/step - accuracy: 0.7216 - loss: 0.7975 - val_accuracy: 0.7360 - val_loss: 0.7663
Epoch 7/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 141s 136ms/step - accuracy: 0.7445 - loss: 0.7442 - val_accuracy: 0.7453 - val_loss: 0.7497
Epoch 8/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 107s 137ms/step - accuracy: 0.7629 - loss: 0.6849 - val_accuracy: 0.7554 - val_loss: 0.7205
Epoch 9/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 106s 135ms/step - accuracy: 0.7818 - loss: 0.6281 - val_accuracy: 0.7557 - val_loss: 0.7289
Epoch 10/10
782/782 ━━━━━━━━━━━━━━━━━━━━ 106s 136ms/step - accuracy: 0.7922 - loss: 0.5946 - val_accuracy: 0.7438 - val_loss: 0.7779
Test Accuracy: 74.38%
Test Loss: 0.7779
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 130ms/step
```