```
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.applications import VGG16
from tensorflow.keras.models import Model
from tensorflow.keras.layers import Dense, Flatten
from tensorflow.keras.optimizers import Adam
from tensorflow.keras.preprocessing.image import ImageDataGenerator
import numpy as np
```

```
train_dir = "C:\\Users\\hp\\Downloads\\cifar-10-img\\cifar-10-img\\train"
test_dir = "C:\Users\Priti\Desktop\monster_d\cifar10\cifar10\\test"
```

```
train_datagen = ImageDataGenerator(
    rescale=1.0 / 255,
)

test_datagen = ImageDataGenerator(
    rescale=1.0 / 255,
)
```

```
train_batch_size = 5000
train_generator = train_datagen.flow_from_directory(
    train_dir,
    target_size=(32, 32),
    batch_size=train_batch_size,
    class_mode='categorical'
)
```

```
Found 40079 images belonging to 10 classes.
```

```
test_batch_size = 1000
test_generator = test_datagen.flow_from_directory(
    test_dir,
    target_size=(32, 32),
    batch_size=test_batch_size,
    class_mode='categorical'
)
```

```
Found 9921 images belonging to 10 classes.
```

```
x_train, y_train =  train_generator[0]
x_test, y_test = test_generator[0]

print(len(x_train))
print(len(x_test))
```

```
5000
1000
```

```
weights_path = "C:\\Users\\hp\\Downloads\\vgg16_weights_tf_dim_ordering_tf_kernels_notop.h5"
base_model = VGG16(weights=weights_path, include_top=False, input_shape=(32, 32, 3))
```

```
for layer in base_model.layers:
   layer.trainable = False
```

```
x = Flatten()(base_model.output)
x = Dense(256, activation='relu')(x)
x = tf.keras.layers.Dropout(0.3)(x)
x = Dense(256, activation='relu')(x)
x = tf.keras.layers.Dropout(0.3)(x)
predictions = Dense(10, activation='softmax')(x)

model = Model(inputs=base_model.input, outputs=predictions)

model.compile(optimizer="adam", loss='categorical_crossentropy', metrics=['accuracy'])
```

```
model.fit(x_train, y_train, batch_size=64, epochs=10, validation_data=(x_test, y_test))
```

```
Epoch 1/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 66s 749ms/step - accuracy: 0.2338 - loss: 2.1125 - val_accuracy: 0.4340 - val_loss: 1.5740
Epoch 2/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 60s 755ms/step - accuracy: 0.4219 - loss: 1.6212 - val_accuracy: 0.4970 - val_loss: 1.4007
Epoch 3/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 58s 736ms/step - accuracy: 0.4881 - loss: 1.4350 - val_accuracy: 0.5140 - val_loss: 1.3675
Epoch 4/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 58s 734ms/step - accuracy: 0.5105 - loss: 1.3606 - val_accuracy: 0.5210 - val_loss: 1.3610
```

```
Epoch 5/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 83s 745ms/step - accuracy: 0.5330 - loss: 1.3025 - val_accuracy: 0.5500 - val_loss: 1.3034
Epoch 6/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 64s 804ms/step - accuracy: 0.5701 - loss: 1.2321 - val_accuracy: 0.5550 - val_loss: 1.2853
Epoch 7/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 63s 793ms/step - accuracy: 0.5987 - loss: 1.1439 - val_accuracy: 0.5440 - val_loss: 1.3056
Epoch 8/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 58s 734ms/step - accuracy: 0.5978 - loss: 1.1131 - val_accuracy: 0.5400 - val_loss: 1.2901
Epoch 9/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 58s 731ms/step - accuracy: 0.6052 - loss: 1.0983 - val_accuracy: 0.5330 - val_loss: 1.2896
Epoch 10/10
79/79 ━━━━━━━━━━━━━━━━━━━━ 58s 739ms/step - accuracy: 0.6393 - loss: 1.0361 - val_accuracy: 0.5440 - val_loss: 1.2701
<keras.src.callbacks.history.History at 0x2226d18f510>
```

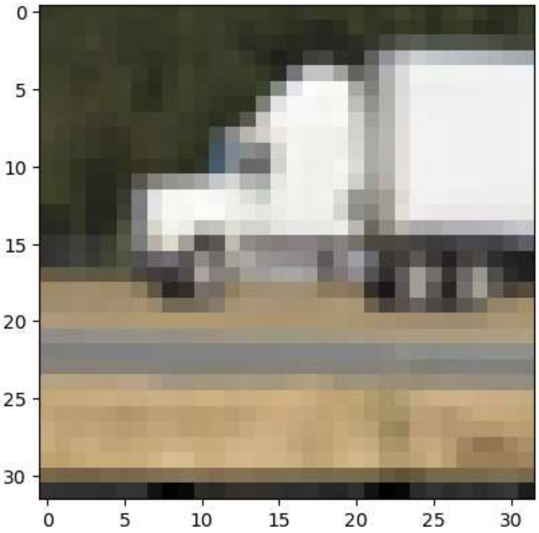
```
import matplotlib.pyplot as plt
predicted_value = model.predict(x_test)
```

```
32/32 ━━━━━━━━━━━━━━━━━━━━ 11s 338ms/step
```

```
labels = list(test_generator.class_indices.keys())
```

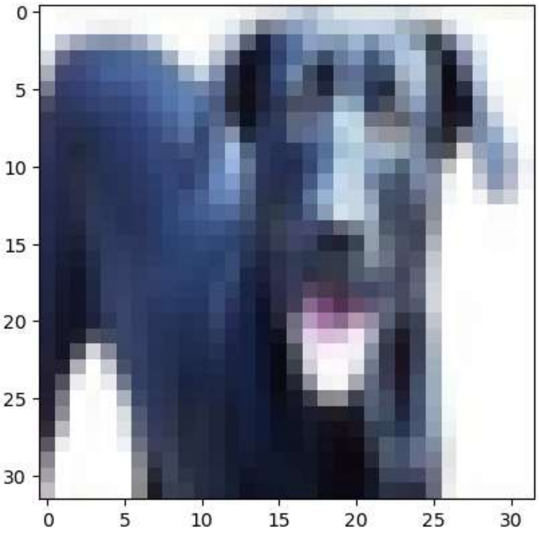
```
n = 890
plt.imshow(x_test[n])
print("Preditcted: ",labels[np.argmax(predicted_value[n])])
print("Actual: ", labels[np.argmax(y_test[n])])
```

```
Preditcted:  truck
Actual:  truck
```



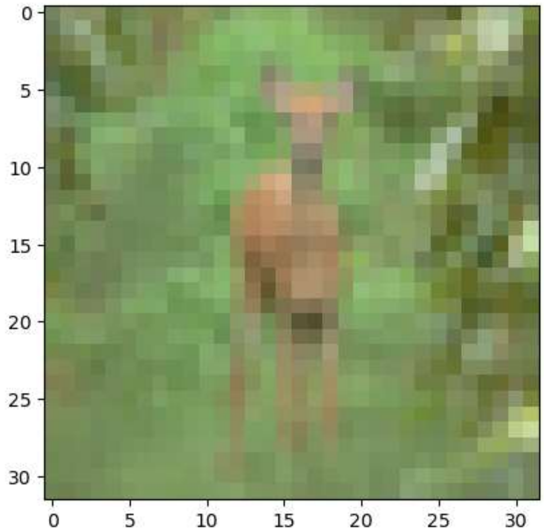
```
n = 590
plt.imshow(x_test[n])
print("Preditcted: ",labels[np.argmax(predicted_value[n])])
print("Actual: ", labels[np.argmax(y_test[n])])
```

```
Preditcted:  dog
Actual:  dog
```



```
n = 600
plt.imshow(x_test[n])
print("Preditcted: ",labels[np.argmax(predicted_value[n])])
print("Actual: ", labels[np.argmax(y_test[n])])
```

```
Preditcted:  deer
Actual:  deer
```



Start coding or generate with AI.