In [1]:
```python
from keras.optimizers import RMSprop
from keras.preprocessing.image import ImageDataGenerator
import cv2
from keras.models import Sequential
from keras.layers import Conv2D, Input, ZeroPadding2D, BatchNormalization, Activation,
from keras.models import Model, load_model
from keras.callbacks import TensorBoard, ModelCheckpoint
from sklearn.model_selection import train_test_split
from sklearn.metrics import f1_score
from sklearn.utils import shuffle
import imutils
import numpy as np
```

In [2]:
```python
model = Sequential([
    Conv2D(100, (3,3), activation='relu', input_shape=(150, 150, 3)),
    MaxPooling2D(2,2),

    Conv2D(100, (3,3), activation='relu'),
    MaxPooling2D(2,2),

    Flatten(),
    Dropout(0.5),
    Dense(50, activation='relu'),
    Dense(2, activation='softmax')
])
```

In [3]:
```python
model.compile(optimizer='adam', loss='binary_crossentropy', metrics=['acc'])
```

In [4]:
```python
TRAINING_DIR = "./train"
train_datagen = ImageDataGenerator(rescale=1.0/255,
                                    rotation_range=40,
                                    width_shift_range=0.2,
                                    height_shift_range=0.2,
                                    shear_range=0.2,
                                    zoom_range=0.2,
                                    horizontal_flip=True,
                                    fill_mode='nearest')
train_generator = train_datagen.flow_from_directory(TRAINING_DIR,
                                                     batch_size=10,
                                                     target_size=(150, 150))
```

Found 1315 images belonging to 2 classes.

In [5]:
```python
VALIDATION_DIR = "./test"
validation_datagen = ImageDataGenerator(rescale=1.0/255)
validation_generator = validation_datagen.flow_from_directory(VALIDATION_DIR,
                                                               batch_size=10,
                                                               target_size=(150, 150))
```

Found 194 images belonging to 2 classes.

In [6]:
```python
checkpoint = ModelCheckpoint('model2-{epoch:03d}.model',monitor='val_loss',verbose=0,sa
```

```
In [7]:  history = model.fit_generator(train_generator,
                                        epochs=10,
                                        validation_data=validation_generator,
                                        callbacks=[checkpoint])
```

```
WARNING:tensorflow:From <ipython-input-7-6272b23e5a0b>:1: Model.fit_generator (from tens
orflow.python.keras.engine.training) is deprecated and will be removed in a future versi
on.
Instructions for updating:
Please use Model.fit, which supports generators.
Epoch 1/10
132/132 [==============================] - ETA: 0s - loss: 0.7647 - acc: 0.4798WARNING:t
ensorflow:From C:\Users\Ram.Reddy\Anaconda3\lib\site-packages\tensorflow\python\training
\tracking\tracking.py:111: Model.state_updates (from tensorflow.python.keras.engine.trai
ning) is deprecated and will be removed in a future version.
Instructions for updating:
This property should not be used in TensorFlow 2.0, as updates are applied automaticall
y.
WARNING:tensorflow:From C:\Users\Ram.Reddy\Anaconda3\lib\site-packages\tensorflow\python
\training\tracking\tracking.py:111: Layer.updates (from tensorflow.python.keras.engine.b
ase_layer) is deprecated and will be removed in a future version.
Instructions for updating:
This property should not be used in TensorFlow 2.0, as updates are applied automaticall
y.
INFO:tensorflow:Assets written to: model2-001.model\assets
132/132 [==============================] - 98s 740ms/step - loss: 0.7647 - acc: 0.4798 -
val_loss: 0.6931 - val_acc: 0.5000
Epoch 2/10
132/132 [==============================] - ETA: 0s - loss: 0.6934 - acc: 0.4844INFO:tens
orflow:Assets written to: model2-002.model\assets
132/132 [==============================] - 96s 726ms/step - loss: 0.6934 - acc: 0.4844 -
val_loss: 0.6931 - val_acc: 0.5000
Epoch 3/10
132/132 [==============================] - 93s 702ms/step - loss: 0.6932 - acc: 0.4973 -
val_loss: 0.6931 - val_acc: 0.5000
Epoch 4/10
132/132 [==============================] - 93s 702ms/step - loss: 0.6932 - acc: 0.4905 -
val_loss: 0.6931 - val_acc: 0.5000
Epoch 5/10
132/132 [==============================] - ETA: 0s - loss: 0.6932 - acc: 0.4806INFO:tens
orflow:Assets written to: model2-005.model\assets
132/132 [==============================] - 95s 722ms/step - loss: 0.6932 - acc: 0.4806 -
val_loss: 0.6931 - val_acc: 0.5000
Epoch 6/10
132/132 [==============================] - 93s 701ms/step - loss: 0.6933 - acc: 0.4806 -
val_loss: 0.6931 - val_acc: 0.5000
Epoch 7/10
132/132 [==============================] - 92s 701ms/step - loss: 0.6932 - acc: 0.4920 -
val_loss: 0.6931 - val_acc: 0.5000
Epoch 8/10
132/132 [==============================] - 92s 699ms/step - loss: 0.6933 - acc: 0.4935 -
val_loss: 0.6931 - val_acc: 0.5000
Epoch 9/10
132/132 [==============================] - 92s 699ms/step - loss: 0.6933 - acc: 0.4867 -
val_loss: 0.6932 - val_acc: 0.5000
Epoch 10/10
132/132 [==============================] - 92s 700ms/step - loss: 0.6932 - acc: 0.5004 -
val_loss: 0.6931 - val_acc: 0.5000
```