In [1]:

```
import numpy as np
import tensorflow
import keras
from keras.models import Sequential
```

```
Using TensorFlow backend.
```

In [2]:

```
cnn_model=Sequential()
```

In [3]:

```
from keras.layers import Dropout,Dense,Conv2D,MaxPooling2D,Flatten
from keras.preprocessing.image import ImageDataGenerator
train_datagen=ImageDataGenerator(rescale=1./255,shear_range=0.2,zoom_range=0.2,horizontal_f
test_datagen=ImageDataGenerator(rescale=1./255)
```

In [6]:

```
x_train=train_datagen.flow_from_directory(r"D:\Project_AI\data\data\trainset",target_size=(
x_test=train_datagen.flow_from_directory(r"D:\Project_AI\data\data\testset",target_size=(64
```

```
Found 349 images belonging to 5 classes.
Found 150 images belonging to 5 classes.
```

In [7]:

```
cnn_model.add(Conv2D(32,3,3,input_shape=(64,64,3),activation='relu'))
cnn_model.add(MaxPooling2D(pool_size=(2,2)))
#cnn_model.add(Dropout(0.25))
cnn_model.add(Flatten())
```

```
C:\Users\HP-PC\Anaconda3\lib\site-packages\ipykernel_launcher.py:1: UserWarn
ing: Update your `Conv2D` call to the Keras 2 API: `Conv2D(32, (3, 3), input
_shape=(64, 64, 3..., activation="relu")`
  """Entry point for launching an IPython kernel.
```

In [8]:

```
#hidden layers
cnn_model.add(Dense(128,activation='relu'))
```

In [9]:

```
#output layer
cnn_model.add(Dense(5,activation='softmax'))
```

In [10]:

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

In [12]:

```
cnn_model.fit_generator(x_train,
                        samples_per_epoch = 5000,
                        nb_epoch = 5,
                        validation_data = x_test,
                        nb_val_samples = 1500)
```

```
C:\Users\HP-PC\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: UserWarn
ing: The semantics of the Keras 2 argument `steps_per_epoch` is not the same
as the Keras 1 argument `samples_per_epoch`. `steps_per_epoch` is the number
of batches to draw from the generator at each epoch. Basically steps_per_epo
ch = samples_per_epoch/batch_size. Similarly `nb_val_samples`->`validation_s
teps` and `val_samples`->`steps` arguments have changed. Update your method
calls accordingly.
  """
C:\Users\HP-PC\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: UserWarn
ing: Update your `fit_generator` call to the Keras 2 API: `fit_generator(<ke
ras.pre..., validation_data=<keras.pre..., steps_per_epoch=156, epochs=5, va
lidation_steps=1500)`
  """


Epoch 1/5
156/156 [==============================] - 472s 3s/step - loss: 1.2793 - acc
uracy: 0.5279 - val_loss: 1.3853 - val_accuracy: 0.4916
Epoch 2/5
156/156 [==============================] - 469s 3s/step - loss: 0.6956 - acc
uracy: 0.7499 - val_loss: 1.0623 - val_accuracy: 0.5177
Epoch 3/5
156/156 [==============================] - 494s 3s/step - loss: 0.4785 - acc
uracy: 0.8442 - val_loss: 1.5701 - val_accuracy: 0.5287
Epoch 4/5
156/156 [==============================] - 475s 3s/step - loss: 0.2921 - acc
uracy: 0.9177 - val_loss: 2.2031 - val_accuracy: 0.5453
Epoch 5/5
156/156 [==============================] - 477s 3s/step - loss: 0.2051 - acc
uracy: 0.9483 - val_loss: 1.3982 - val_accuracy: 0.5248
```

Out[12]:

```
<keras.callbacks.callbacks.History at 0x4c0aae5dc8>
```

In [13]:

```
cnn_model.save('D:\Project_AI\model_op\crop_protection_model.h5')  #use this location for p
```

In [14]:

```
import numpy as np
from keras.preprocessing import image
```

In [18]:

```
import numpy as np
from keras.preprocessing import image

from tkinter import *
from PIL import ImageTk, Image
from tkinter import filedialog
import os
from keras.models import load_model
#classifier = load_model('cancer_class_model_with_test.h5')
classifier = load_model('D:\Project_AI\model_op\crop_protection_model.h5')

classifier.compile(optimizer = 'adam', loss = 'categorical_crossentropy', metrics = ['accur
root = Tk()
root.geometry("550x300+300+150")
root.resizable(width=True, height=True)

def openfn():
    filename = filedialog.askopenfilename(title='open')
    return filename
def open_img():
    x = openfn()
    test_image = image.load_img(x, target_size = (64,64))
    test_image = image.img_to_array(test_image)
    test_image = np.expand_dims(test_image, axis = 0)
    result = classifier.predict_classes(test_image)
    print(result)
    if result==0:
        print('Gulls')
    elif result==1:
        print('Herons')
    elif result==2:
        print('Hornbill')
    elif result==3:
        print('Peacock')
    elif result==4:
        print('Sparrow')
    else:
        print('Nan')
    index=["Gulls","Herons","Hornbill","Peacock","Sparrow"]
    label = Label( root, text="Prediction : "+index[result[0][0]])
    label.pack()
    img = Image.open(x)
    img = img.resize((250, 250), Image.ANTIALIAS)
    img = ImageTk.PhotoImage(img)
    panel = Label(root, image=img)
    panel.image = img
    panel.pack()

btn = Button(root, text='open image', command=open_img).pack()

root.mainloop()
```

```
[4]
Sparrow

Exception in Tkinter callback
```

```
Traceback (most recent call last):
  File "C:\Users\HP-PC\Anaconda3\lib\tkinter\__init__.py", line 1705, in __c
all__
    return self.func(*args)
  File "<ipython-input-18-86e9d33f8287>", line 40, in open_img
    label = Label( root, text="Prediction : "+index[result[0][0]])
IndexError: invalid index to scalar variable.



[1]
Herons

Exception in Tkinter callback
Traceback (most recent call last):
  File "C:\Users\HP-PC\Anaconda3\lib\tkinter\__init__.py", line 1705, in __c
all__
    return self.func(*args)
  File "<ipython-input-18-86e9d33f8287>", line 40, in open_img
    label = Label( root, text="Prediction : "+index[result[0][0]])
IndexError: invalid index to scalar variable.



[2]
Hornbill

Exception in Tkinter callback
Traceback (most recent call last):
  File "C:\Users\HP-PC\Anaconda3\lib\tkinter\__init__.py", line 1705, in __c
all__
    return self.func(*args)
  File "<ipython-input-18-86e9d33f8287>", line 40, in open_img
    label = Label( root, text="Prediction : "+index[result[0][0]])
IndexError: invalid index to scalar variable.



[1]
Herons

Exception in Tkinter callback
Traceback (most recent call last):
  File "C:\Users\HP-PC\Anaconda3\lib\tkinter\__init__.py", line 1705, in __c
all__
    return self.func(*args)
  File "<ipython-input-18-86e9d33f8287>", line 40, in open_img
    label = Label( root, text="Prediction : "+index[result[0][0]])
IndexError: invalid index to scalar variable.
```

In [ ]: