Assignment – 3

Build an CNN Model for classification of flowers

Assignment Date	10 October 2022
Student Name	Sanjana .L
Student Roll Number	820419106049
Maximum Marks	2 Marks

- Download the dataset
- Image Augmentation
- Create model
- Add layers (Convolution, MaxPooling, Flatten, Dense-(hidden layers),output)
- Compile the model
- Fit the model
- Save the model
- Test the model

Unzip the Data:

```
[ ]  ls

        sample_data/

[ ]  cd /content/drive/MyDrive/Dataset

        /content/drive/MyDrive/Dataset

[ ]  ls

        Churn_Modelling.csv  Flowers-Dataset.zip

[ ]  !unzip Flowers-Dataset.zip

        Archive:  Flowers-Dataset.zip
          inflating: flowers/daisy/100080576_f52e8ee070_n.jpg
          inflating: flowers/daisy/10140303196_b88d3d6cec.jpg
          inflating: flowers/daisy/10172379554_b296050f82_n.jpg
          inflating: flowers/daisy/10172567486_2748826a8b.jpg
          inflating: flowers/daisy/10172636503_21bededa75_n.jpg
          inflating: flowers/daisy/102841525_bd6628ae3c.jpg
          inflating: flowers/daisy/10300722094_28fa978807_n.jpg
          inflating: flowers/daisy/1031799732_e7f4008c03.jpg
          inflating: flowers/daisy/10391248763_1d16681106_n.jpg
          inflating: flowers/daisy/10437754174_22ec990b77_m.jpg
          inflating: flowers/daisy/10437770546_8bb6f7bdd3_m.jpg
```

Image Augmentation:

```
[ ]  from tensorflow.keras.preprocessing.image import ImageDataGenerator

[ ]  train_datagen = ImageDataGenerator(rescale=1./255,horizontal_flip = True,vertical_flip=True,zoom_range=0.2)

[ ]  test_datagen=ImageDataGenerator(rescale=1./255)

[ ]  x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/Dataset/flowers",target_size=(64,64),class_mode="categorical",batch_size=24)

        Found 4317 images belonging to 5 classes.

 ▶   x_test=test_datagen.flow_from_directory(r"/content/drive/MyDrive/Dataset/flowers",target_size=(64,64),class_mode="categorical",batch_size=24)

     Found 4317 images belonging to 5 classes.
```

Add layers to the model:

```
[ ]  #model

[ ]  from tensorflow.keras.models import Sequential
     from tensorflow.keras.layers import Convolution2D,MaxPooling2D,Flatten,Dense

[ ]  model=Sequential()

[ ]  model.add(Convolution2D(32,(3,3),activation="relu", input_shape=(64,64,3)))

 ▶   model.add(MaxPooling2D(pool_size=(2,2)))

[ ]  model.add(Flatten())

[ ]  model.add(Dense(300,activation='relu'))

[ ]  model.add(Dense(5,activation='softmax'))
```

Compile the model:

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

[ ] len(x_train)

    180
```

Fit and save the model:

```
[ ] model.fit(x_train,epochs=5,validation_data=x_test,steps_per_epoch=len(x_train),validation_steps=len(x_test))

    Epoch 1/5
    180/180 [==============================] - 127s 701ms/step - loss: 1.2830 - accuracy: 0.4656 - val_loss: 1.0815 - val_accuracy: 0.5617
    Epoch 2/5
    180/180 [==============================] - 128s 710ms/step - loss: 1.0532 - accuracy: 0.5905 - val_loss: 0.9313 - val_accuracy: 0.6500
    Epoch 3/5
    180/180 [==============================] - 127s 707ms/step - loss: 0.9782 - accuracy: 0.6173 - val_loss: 0.8848 - val_accuracy: 0.6498
    Epoch 4/5
    180/180 [==============================] - 126s 698ms/step - loss: 0.8780 - accuracy: 0.6625 - val_loss: 0.7988 - val_accuracy: 0.6924
    Epoch 5/5
    180/180 [==============================] - 125s 694ms/step - loss: 0.8391 - accuracy: 0.6757 - val_loss: 0.7901 - val_accuracy: 0.6908
    <keras.callbacks.History at 0x7f93968e53d0>

[ ] model.save('flowers.h5')
```

Test the model:

```
[ ] #testing of the model

[ ] from tensorflow.keras.models import load_model
    from tensorflow.keras.preprocessing import image
    import numpy as np

[ ] model=load_model("/content/drive/MyDrive/Dataset/flowers.h5")

[ ] img=image.load_img("/content/drive/MyDrive/Dataset/flowers/daisy/10140303196_b88d3d6cec.jpg",target_size=(64,64))

[ ] img
```



```
[ ] x=image.img_to_array

[ ] x

    <function keras.preprocessing.image.img_to_array(img, data_format=None, dtype=None)>
```