Lu Guannan
20454477

Project2

In this project, I use transfer learning to predict the categories of flowers and speed up the training time.

First, load VGG16 from imagenet

Second, add three fully-connected layers, the structure are show as follows:

Layer (type)	Output Shape	Param #
image_input (InputLayer)	(None, 124, 124, 3)	0
vgg16 (Model)	multiple	14714688
flatten (Flatten)	(None, 4608)	0
fc1 (Dense)	(None, 4096)	18878464
fc2 (Dense)	(None, 4096)	16781312
predictions (Dense)	(None, 5)	20485

Total params: 50,394,949
Trainable params: 35,680,261
Non-trainable params: 14,714,688

Third, load data and train with batch_size=40, epochs=3

```
Train on 2495 samples, validate on 624 samples
Epoch 1/3
2495/2495 [==============================] - 251s 100ms/step - loss: 1.2859 - acc: 0.4998 - val_loss: 1.1719 - val_ac
c: 0.5817
Epoch 2/3
2495/2495 [==============================] - 250s 100ms/step - loss: 0.9613 - acc: 0.6425 - val_loss: 0.9046 - val_ac
c: 0.6554
Epoch 3/3
2495/2495 [==============================] - 254s 102ms/step - loss: 0.8011 - acc: 0.7134 - val_loss: 0.8314 - val_ac
c: 0.6875
```

Last, predict