ANN_cifa100

```
import numpy as np
import matplotlib.pyplot as plt
from keras.layers import Dense, Activation, Dropout, BatchNormalization, LSTM
from keras.models import Sequential
from tensorflow.keras.utils import to_categorical
from keras import optimizers
from tensorflow.keras.optimizers import RMSprop

from skimage import color
from keras.datasets import cifar100


(x_train, y_train), (x_test, y_test) = cifar100.load_data()

x_train  =color.rgb2gray(x_train)
print(x_train.shape)
x_test = color.rgb2gray(x_test)
print(x_test.shape)
```

```
(50000, 32, 32)
(10000, 32, 32)
```

```
x=x_test
x_train = x_train.reshape(50000,1024)
x_test = x_test.reshape(10000,1024)
x_train = x_train.astype('float32')
x_test = x_test.astype('float32')
x_train /= 255
x_test /= 255


y_train = to_categorical(y_train,100)
y_test = to_categorical(y_test,100)


model = Sequential()
model.add(Dense(512,activation='relu',input_shape=(1024,)))
model.add(Dense(500,activation='relu'))
model.add(Dense(100,activation='relu'))
model.add(Dense(100,activation='softmax'))
model.summary()
```

```
Model: "sequential_1"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 dense_4 (Dense)             (None, 512)               524800

 dense_5 (Dense)             (None, 500)               256500

 dense_6 (Dense)             (None, 100)               50100

 dense_7 (Dense)             (None, 100)               10100
```

```
=================================================================
Total params: 841,500
Trainable params: 841,500
Non-trainable params: 0
_________________________________________________________________
```

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

```
history = model.fit(x_train,y_train,batch_size=128,epochs=20,verbose=1,validation_data=(x_test,y_t
```

```
Epoch 1/20
391/391 [==============================] - 9s 22ms/step - loss: 4.5387 - accuracy: 0.0192 - v
Epoch 2/20
391/391 [==============================] - 8s 22ms/step - loss: 4.3698 - accuracy: 0.0397 - v
Epoch 3/20
391/391 [==============================] - 9s 22ms/step - loss: 4.2667 - accuracy: 0.0516 - v
Epoch 4/20
391/391 [==============================] - 8s 22ms/step - loss: 4.2270 - accuracy: 0.0549 - v
Epoch 5/20
391/391 [==============================] - 8s 22ms/step - loss: 4.1982 - accuracy: 0.0610 - v
Epoch 6/20
391/391 [==============================] - 8s 22ms/step - loss: 4.1667 - accuracy: 0.0674 - v
Epoch 7/20
391/391 [==============================] - 8s 22ms/step - loss: 4.1307 - accuracy: 0.0735 - v
Epoch 8/20
391/391 [==============================] - 8s 22ms/step - loss: 4.1009 - accuracy: 0.0801 - v
Epoch 9/20
391/391 [==============================] - 8s 22ms/step - loss: 4.0688 - accuracy: 0.0856 - v
Epoch 10/20
391/391 [==============================] - 9s 23ms/step - loss: 4.0366 - accuracy: 0.0903 - v
Epoch 11/20
391/391 [==============================] - 10s 25ms/step - loss: 4.0114 - accuracy: 0.0951 -
Epoch 12/20
391/391 [==============================] - 8s 22ms/step - loss: 3.9905 - accuracy: 0.0975 - v
Epoch 13/20
391/391 [==============================] - 8s 22ms/step - loss: 3.9734 - accuracy: 0.0997 - v
Epoch 14/20
391/391 [==============================] - 8s 22ms/step - loss: 3.9537 - accuracy: 0.1039 - v
Epoch 15/20
391/391 [==============================] - 8s 22ms/step - loss: 3.9363 - accuracy: 0.1068 - v
Epoch 16/20
391/391 [==============================] - 8s 22ms/step - loss: 3.9180 - accuracy: 0.1106 - v
Epoch 17/20
391/391 [==============================] - 8s 22ms/step - loss: 3.9013 - accuracy: 0.1138 - v
Epoch 18/20
391/391 [==============================] - 8s 21ms/step - loss: 3.8848 - accuracy: 0.1176 - v
Epoch 19/20
391/391 [==============================] - 8s 22ms/step - loss: 3.8710 - accuracy: 0.1189 - v
Epoch 20/20
391/391 [==============================] - 8s 22ms/step - loss: 3.8565 - accuracy: 0.1211 - v
```

```
score = model.evaluate(x_test, y_test,verbose=0)
print('Sai so kiem tra la:', score[0])
print('Do chinh xac kiem tra la:', score[1])
```

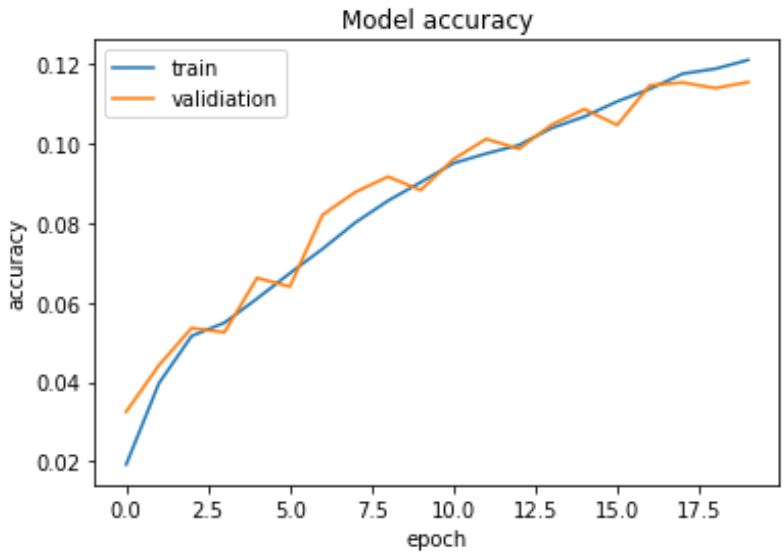
```
Sai so kiem tra la: 3.9376039505004883
Do chinh xac kiem tra la: 0.11550000309944153
```

```
model.save('Cifar10.h5')
from tensorflow.keras.models import load_model
model = load_model('Cifar10.h5')
```

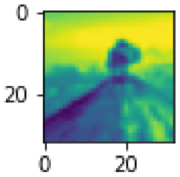
```
plt.plot(history.history['accuracy'])
plt.plot(history.history['val_accuracy'])
plt.title('Model accuracy')
plt.ylabel('accuracy')
plt.xlabel('epoch')
plt.legend(['train','validiation'], loc = 'upper-left')
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:6: MatplotlibDeprecationWarning
        best
        upper right
        upper left
        lower left
        lower right
        right
        center left
        center right
        lower center
        upper center
        center
This will raise an exception in 3.3.

<matplotlib.legend.Legend at 0x7fd41015f550>
```




```
import numpy as np
Y_pred = model.predict(x_test)
for i in range(9):
  plt.subplot(330 +i+1)
  plt.imshow(x[i])
  plt.show()
  print(np.round(y_pred[i]))
```

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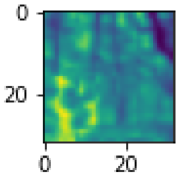


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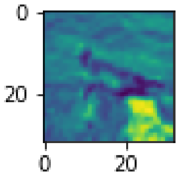


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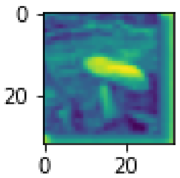


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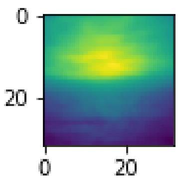


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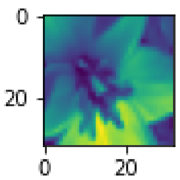


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[0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
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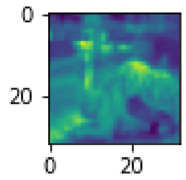


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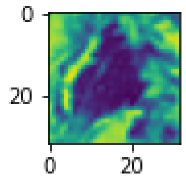


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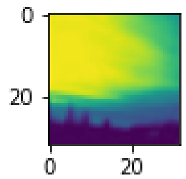


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