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    "Y = le.fit_transform(Y)\n",
    "Y = Y.reshape(-1,1)"
   ]
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    "from sklearn.model_selection import train_test_split\n",
    "from sklearn.preprocessing import LabelEncoder\n",
    "from keras.models import Model\n",
    "from keras.layers import LSTM, Activation, Dense, Dropout, Input, Embedding\n",
    "from keras.preprocessing.text import Tokenizer\n",
    "from keras.preprocessing import sequence\n",
    "from keras.callbacks import EarlyStopping\n",
    "%matplotlib inline"
   ]
  },
  {
   "cell_type": "code",
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  "X_train,X_test,Y_train,Y_test = train_test_split(X,Y,test_size=0.15)"
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  "from keras.preprocessing.sequence import pad_sequences"
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  "max_words = 1000\n",
  "max_len = 150\n",
  "tok = Tokenizer(num_words=max_words)\n",
  "tok.fit_on_texts(X_train)\n",
  "sequences = tok.texts_to_sequences(X_train)\n",
  "sequences_matrix = pad_sequences(sequences,maxlen=max_len)"
 ]
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  "def RNN():\n",
  "    inputs = Input(name='inputs',shape=[max_len])\n",
  "    layer = Embedding(max_words,50,input_length=max_len)(inputs)\n",
  "    layer = LSTM(64)(layer)\n",
  "    layer = Dense(256,name='FC1')(layer)\n",
  "    layer = Activation('relu')(layer)\n",
  "    layer = Dropout(0.5)(layer)\n",
  "    layer = Dense(1,name='out_layer')(layer)\n",
  "    layer = Activation('sigmoid')(layer)\n",
  "    model = Model(inputs=inputs,outputs=layer)\n",
  "    return model"
 ]
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"_____\n",
     " Layer (type)                Output Shape              Param #
\n",

"=================================================================\n",
     " inputs (InputLayer)         [(None, 150)]             0
\n",
     "
\n",
     " embedding (Embedding)       (None, 150, 50)           50000
\n",
     "
\n",
     " lstm (LSTM)                 (None, 64)                29440
\n",
     "
\n",
     " FC1 (Dense)                 (None, 256)               16640
\n",
     "
\n",
     " activation (Activation)     (None, 256)               0
\n",
     "
\n",
     " dropout (Dropout)           (None, 256)               0
\n",
     "
\n",
     " out_layer (Dense)           (None, 1)                 257
\n",
     "
\n",
     " activation_1 (Activation)   (None, 1)                 0
\n",
     "
\n",

"=================================================================\n",
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     "Trainable params: 96,337\n",
     "Non-trainable params: 0\n",
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   "model.summary()"
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 },
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```
    "from tensorflow.keras.optimizers import RMSprop"
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"model.compile(loss='binary_crossentropy',optimizer=RMSprop(),metrics=['acc
uracy'])"
   ]
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      "Epoch 1/10\n",
      "30/30 [==============================] - 6s 144ms/step - loss:
0.3212 - accuracy: 0.8743 - val_loss: 0.1448 - val_accuracy: 0.9473\n",
      "Epoch 2/10\n",
      "30/30 [==============================] - 4s 129ms/step - loss:
0.0865 - accuracy: 0.9810 - val_loss: 0.0528 - val_accuracy: 0.9873\n"
     ]
    },
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      ]
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   "source": [
    "model.fit(sequences_matrix,Y_train,batch_size=128,epochs=10,\n",
    "
validation_split=0.2,callbacks=[EarlyStopping(monitor='val_loss',min_delta=
0.0001)])"
   ]
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         "       [  0,    0,    0, ..., 296,  27, 338],\n",
         "       ...,\n",
         "       [  0,    0,    0, ..., 621, 377, 190],\n",
         "       [  0,    0,    0, ...,  93, 143,  11],\n",
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      "test_sequences_matrix =
pad_sequences(test_sequences,maxlen=max_len)\n",
      "test_sequences_matrix"
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       "output_type": "stream",
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        "27/27 [==============================] - 0s 13ms/step - loss: 0.0951
- accuracy: 0.9749\n",
        "Accuracy: 0.9748803973197937\n",
        "Loss: 0.09510093927383423\n"
       ]
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     ],
     "source": [
      "accr = model.evaluate(test_sequences_matrix,Y_test)\n",
      "print('Accuracy:',accr[1])\n",
      "print('Loss:',accr[0])"
     ]
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