

```
1 D:\OneDrive\TFG\TFG_Python\venv\Scripts\python.exe C:\
  Users\elias\AppData\Local\JetBrains\Toolbox\apps\PyCharm-P
  \ch-0\183.4284.139\helpers\pydev\pydevconsole.py --mode=
  client --port=52945
2
3 import sys; print('Python %s on %s' % (sys.version, sys.
  platform))
4 sys.path.extend(['D:\\OneDrive\\TFG\\TFG_Python', 'D:/
  OneDrive/TFG/TFG_Python'])
5
6 PyDev console: starting.
7
8 Python 3.6.7 (v3.6.7:6ec5cf24b7, Oct 20 2018, 13:35:33) [
  MSC v.1900 64 bit (AMD64)] on win32
9 >>> runfile('D:/OneDrive/TFG/TFG_Python/core/model.py',
  wdir='D:/OneDrive/TFG/TFG_Python/core')
10 Using TensorFlow backend.
11 ISBINARY: True
12 tipo
13 benign          2510
14 malignant       2510
15 premalignant    2510
16 dtype: int64
17 Valid gen: Img leidas= 0
18 Valid gen: Img leidas= 100
19 Valid gen: Img leidas= 200
20 Valid gen: Img leidas= 300
21 Valid gen: Img leidas= 400
22 Valid gen: Img leidas= 500
23 Valid gen: Img leidas= 600
24 Valid gen: Img leidas= 700
25 Valid gen: Img leidas= 800
26 Valid gen: Img leidas= 900
27 Valid gen: Img leidas= 1000
28 Valid gen: Img leidas= 1100
29 Valid gen: Img leidas= 1200
30 Creando modelo y compilandolo
31 2019-04-27 17:06:33.477696: I tensorflow/core/platform/
  cpu_feature_guard.cc:141] Your CPU supports instructions
  that this TensorFlow binary was not compiled to use: AVX2
32 2019-04-27 17:06:33.749536: I tensorflow/core/
  common_runtime/gpu/gpu_device.cc:1432] Found device 0 with
  properties:
33 name: GeForce GTX 1070 major: 6 minor: 1 memoryClockRate(
  GHz): 1.835
```

```
34 pciBusID: 0000:26:00.0
35 totalMemory: 8.00GiB freeMemory: 6.64GiB
36 2019-04-27 17:06:33.749726: I tensorflow/core/
    common_runtime/gpu/gpu_device.cc:1511] Adding visible gpu
    devices: 0
37 2019-04-27 17:06:36.294797: I tensorflow/core/
    common_runtime/gpu/gpu_device.cc:982] Device interconnect
    StreamExecutor with strength 1 edge matrix:
38 2019-04-27 17:06:36.294899: I tensorflow/core/
    common_runtime/gpu/gpu_device.cc:988] 0
39 2019-04-27 17:06:36.294955: I tensorflow/core/
    common_runtime/gpu/gpu_device.cc:1001] 0: N
40 2019-04-27 17:06:36.299294: I tensorflow/core/
    common_runtime/gpu/gpu_device.cc:1115] Created TensorFlow
    device (/job:localhost/replica:0/task:0/device:GPU:0 with
    6397 MB memory) -> physical GPU (device: 0, name: GeForce
    GTX 1070, pci bus id: 0000:26:00.0, compute capability: 6.
    1)
41 Se comienza el entrenamiento del modelo
42 ['loss', 'acc']
43 Epoch 1/40
44 2019-04-27 17:07:10.239911: E tensorflow/stream_executor/
    cuda/cuda_blas.cc:464] failed to create cublas handle:
    CUBLAS_STATUS_ALLOC_FAILED
45 2019-04-27 17:07:10.240354: E tensorflow/stream_executor/
    cuda/cuda_blas.cc:464] failed to create cublas handle:
    CUBLAS_STATUS_ALLOC_FAILED
46 2019-04-27 17:07:10.242347: E tensorflow/stream_executor/
    cuda/cuda_blas.cc:464] failed to create cublas handle:
    CUBLAS_STATUS_ALLOC_FAILED
47 2019-04-27 17:07:10.242504: E tensorflow/stream_executor/
    cuda/cuda_blas.cc:464] failed to create cublas handle:
    CUBLAS_STATUS_ALLOC_FAILED
48 2019-04-27 17:07:10.242721: E tensorflow/stream_executor/
    cuda/cuda_blas.cc:464] failed to create cublas handle:
    CUBLAS_STATUS_ALLOC_FAILED
49 2019-04-27 17:07:10.242875: E tensorflow/stream_executor/
    cuda/cuda_blas.cc:464] failed to create cublas handle:
    CUBLAS_STATUS_ALLOC_FAILED
50 - 69s - loss: 0.7339 - acc: 0.6698 - val_loss: 1.8159 -
    val_acc: 0.5668
51 Epoch 2/40
52 - 63s - loss: 0.5428 - acc: 0.7833 - val_loss: 0.8361 -
    val_acc: 0.7079
53 Epoch 3/40
```

```
54 - 62s - loss: 0.5127 - acc: 0.7823 - val_loss: 1.4422 -  
    val_acc: 0.7444  
55 Epoch 4/40  
56 - 60s - loss: 0.4268 - acc: 0.8260 - val_loss: 0.4941 -  
    val_acc: 0.8166  
57 Epoch 5/40  
58 - 64s - loss: 0.4464 - acc: 0.8062 - val_loss: 0.3803 -  
    val_acc: 0.8398  
59 Epoch 6/40  
60 - 57s - loss: 0.3740 - acc: 0.8448 - val_loss: 0.3721 -  
    val_acc: 0.8390  
61 Epoch 7/40  
62 - 63s - loss: 0.3338 - acc: 0.8573 - val_loss: 0.3838 -  
    val_acc: 0.8407  
63 Epoch 8/40  
64 - 57s - loss: 0.3438 - acc: 0.8583 - val_loss: 0.4672 -  
    val_acc: 0.7851  
65 Epoch 9/40  
66 - 59s - loss: 0.3095 - acc: 0.8625 - val_loss: 0.5365 -  
    val_acc: 0.7884  
67 Epoch 10/40  
68 - 57s - loss: 0.3201 - acc: 0.8740 - val_loss: 0.6339 -  
    val_acc: 0.7353  
69 Epoch 11/40  
70 - 55s - loss: 0.2846 - acc: 0.8823 - val_loss: 0.4514 -  
    val_acc: 0.8199  
71  
72 Epoch 00011: ReduceLROnPlateau reducing learning rate to 0  
    .000200000000949949026.  
73 Epoch 12/40  
74 - 57s - loss: 0.2433 - acc: 0.9021 - val_loss: 0.4642 -  
    val_acc: 0.8174  
75 Epoch 13/40  
76 - 62s - loss: 0.2326 - acc: 0.9198 - val_loss: 0.3887 -  
    val_acc: 0.8423  
77 Epoch 14/40  
78 - 62s - loss: 0.2273 - acc: 0.9167 - val_loss: 0.3593 -  
    val_acc: 0.8456  
79 Epoch 15/40  
80 - 57s - loss: 0.2373 - acc: 0.9156 - val_loss: 0.3812 -  
    val_acc: 0.8506  
81 Epoch 16/40  
82 - 53s - loss: 0.1950 - acc: 0.9292 - val_loss: 0.3615 -  
    val_acc: 0.8606  
83 Epoch 17/40
```

```
84 - 65s - loss: 0.1753 - acc: 0.9354 - val_loss: 0.4107 -  
    val_acc: 0.8556  
85 Epoch 18/40  
86 - 60s - loss: 0.1680 - acc: 0.9406 - val_loss: 0.3409 -  
    val_acc: 0.8689  
87 Epoch 19/40  
88 - 61s - loss: 0.1554 - acc: 0.9448 - val_loss: 0.3995 -  
    val_acc: 0.8531  
89 Epoch 20/40  
90 - 55s - loss: 0.1259 - acc: 0.9531 - val_loss: 0.4019 -  
    val_acc: 0.8531  
91 Epoch 21/40  
92 - 60s - loss: 0.1360 - acc: 0.9573 - val_loss: 0.3345 -  
    val_acc: 0.8697  
93 Epoch 22/40  
94 - 60s - loss: 0.1408 - acc: 0.9521 - val_loss: 0.3684 -  
    val_acc: 0.8631  
95 Epoch 23/40  
96 - 53s - loss: 0.1380 - acc: 0.9573 - val_loss: 0.3775 -  
    val_acc: 0.8647  
97 Epoch 24/40  
98 - 56s - loss: 0.0911 - acc: 0.9656 - val_loss: 0.3434 -  
    val_acc: 0.8705  
99 Epoch 25/40  
100 - 62s - loss: 0.1058 - acc: 0.9635 - val_loss: 0.3609 -  
    val_acc: 0.8722  
101 Epoch 26/40  
102 - 54s - loss: 0.1087 - acc: 0.9646 - val_loss: 0.4177 -  
    val_acc: 0.8622  
103  
104 Epoch 00026: ReduceLROnPlateau reducing learning rate to  
    2.0000000949949027e-05.  
105 Epoch 27/40  
106 - 61s - loss: 0.1168 - acc: 0.9646 - val_loss: 0.3918 -  
    val_acc: 0.8705  
107 Epoch 28/40  
108 - 73s - loss: 0.0887 - acc: 0.9760 - val_loss: 0.3759 -  
    val_acc: 0.8714  
109 Epoch 29/40  
110 - 75s - loss: 0.0766 - acc: 0.9750 - val_loss: 0.3648 -  
    val_acc: 0.8680  
111 Epoch 30/40  
112 - 58s - loss: 0.0972 - acc: 0.9708 - val_loss: 0.3651 -  
    val_acc: 0.8697  
113 Epoch 31/40
```

```
114 - 62s - loss: 0.0988 - acc: 0.9667 - val_loss: 0.3620 -  
    val_acc: 0.8697  
115  
116 Epoch 00031: ReduceLROnPlateau reducing learning rate to  
    2.0000001313746906e-06.  
117 Entrenamiento completado, se procede al test final  
118  
119 32/1506 [.....] - ETA: 5s  
120 64/1506 [>.....] - ETA: 5s  
121 96/1506 [>.....] - ETA: 4s  
122 128/1506 [=>.....] - ETA: 4s  
123 160/1506 [==>.....] - ETA: 4s  
124 192/1506 [==>.....] - ETA: 4s  
125 224/1506 [===>.....] - ETA: 4s  
126 256/1506 [===>.....] - ETA: 4s  
127 288/1506 [===>.....] - ETA: 4s  
128 320/1506 [===>.....] - ETA: 4s  
129 352/1506 [====>.....] - ETA: 3s  
130 384/1506 [====>.....] - ETA: 3s  
131 416/1506 [====>.....] - ETA: 3s  
132 448/1506 [====>.....] - ETA: 3s  
133 480/1506 [====>.....] - ETA: 3s  
134 512/1506 [====>.....] - ETA: 3s  
135 544/1506 [====>.....] - ETA: 3s  
136 576/1506 [====>.....] - ETA: 3s  
137 608/1506 [====>.....] - ETA: 3s  
138 640/1506 [====>.....] - ETA: 2s  
139 672/1506 [====>.....] - ETA: 2s  
140 704/1506 [====>.....] - ETA: 2s  
141 736/1506 [====>.....] - ETA: 2s  
142 768/1506 [====>.....] - ETA: 2s  
143 800/1506 [====>.....] - ETA: 2s  
144 832/1506 [====>.....] - ETA: 2s  
145 864/1506 [====>.....] - ETA: 2s  
146 896/1506 [====>.....] - ETA: 2s  
147 928/1506 [====>.....] - ETA: 1s  
148 960/1506 [====>.....] - ETA: 1s  
149 992/1506 [====>.....] - ETA: 1s  
150 1024/1506 [====>.....] - ETA: 1s  
151 1056/1506 [====>.....] - ETA: 1s  
152 1088/1506 [====>.....] - ETA: 1s  
153 1120/1506 [====>.....] - ETA: 1s  
154 1152/1506 [====>.....] - ETA: 1s  
155 1184/1506 [====>.....] - ETA: 1s  
156 1216/1506 [====>.....] - ETA: 0s
```

```
157 1248/1506 [=====>.....] - ETA: 0s
158 1280/1506 [=====>.....] - ETA: 0s
159 1312/1506 [=====>....] - ETA: 0s
160 1344/1506 [=====>....] - ETA: 0s
161 1376/1506 [=====>...] - ETA: 0s
162 1408/1506 [=====>..] - ETA: 0s
163 1440/1506 [=====>..] - ETA: 0s
164 1472/1506 [=====>.] - ETA: 0s
165 1504/1506 [=====>.] - ETA: 0s
166 1506/1506 [=====] - 5s 4ms/step
167 ['loss', 'acc']
168 [0.314492099083265, 0.8698539176626826]
169 Ahora vamos a dibujar la matriz de confusion
170 ['benign', 'prealignant', 'malignant']
171 Normalized confusion matrix
172 [[0.826      0.148      0.026      ]
173  [0.21169355 0.78830645 0.         ]
174  [0.00392157 0.00392157 0.99215686]]
175 El entrenamiento ha llevado : 2103.538368701935
176
```