```
 6 weights_filename = 'dqn_{}_weights.h5f'.format(ENV_NAME)
 7 weights_filename = date_time + '_' + weights_filename
 8
 9 # checkpoint por intervalo
10 saved_model='dqn_PartialRunPong_weight_{step}.h5'
11 checkpoint = ModelIntervalCheckpoint(saved_model, interval=500000)
12
13 # logs para TensorBoard
14 tb_log_dir = 'logs/tmp'
15 tb_callback = TensorBoard(log_dir=tb_log_dir, histogram_freq=0, write_graph=True)
16
17 nb_steps = 1750000
18 nb_steps = train_steps
19 # Entrenamento con diferentes callbacks
20 #dqn.fit(env, nb_steps=nb_steps, visualize=False, callbacks=[checkpoint, tb_callback], verbose=2)
21 #dqn.fit(env, nb_steps=nb_steps, visualize=False, callbacks=[tb_callback], verbose=2)
22 #dqn.fit(env, nb_steps=nb_steps, visualize=False, callbacks=[checkpoint], verbose=2)
23 train_history = dqn.fit(env, nb_steps=nb_steps, visualize=False,verbose=2)
24
25
26 dqn.save_weights(weights_filename, overwrite=True)
27 print("Pesos guardados en:",weights_filename)
28
29 #nb_episodes = 3
30 #dqn.test(env, nb_episodes=nb_episodes, visualize=False)
31
32 grafica_entrenamiento(train_history)
33
34 calcula_media_test(dqn)
35
36 # colab 397.328 segundos
37 # local 754.133 segundos
```

⤷

```
Training for 250000 steps ...
    850/250000: episode: 1, duration: 2.170s, episode steps: 850, steps per second: 392, episode reward: -21.000, mean rew
   1723/250000: episode: 2, duration: 1.937s, episode steps: 873, steps per second: 451, episode reward: -21.000, mean rew
   2780/250000: episode: 3, duration: 2.269s, episode steps: 1057, steps per second: 466, episode reward: -19.000, mean re
   3639/250000: episode: 4, duration: 1.915s, episode steps: 859, steps per second: 449, episode reward: -21.000, mean rew
   4577/250000: episode: 5, duration: 2.030s, episode steps: 938, steps per second: 462, episode reward: -19.000, mean rew
   5804/250000: episode: 6, duration: 2.665s, episode steps: 1227, steps per second: 460, episode reward: -19.000, mean re
   6657/250000: episode: 7, duration: 1.872s, episode steps: 853, steps per second: 456, episode reward: -21.000, mean rew
   7861/250000: episode: 8, duration: 2.636s, episode steps: 1204, steps per second: 457, episode reward: -19.000, mean re
   8687/250000: episode: 9, duration: 1.851s, episode steps: 826, steps per second: 446, episode reward: -21.000, mean rew
   9671/250000: episode: 10, duration: 2.143s, episode steps: 984, steps per second: 459, episode reward: -19.000, mean re
  10491/250000: episode: 11, duration: 1.746s, episode steps: 820, steps per second: 470, episode reward: -21.000, mean re
  11313/250000: episode: 12, duration: 1.791s, episode steps: 822, steps per second: 459, episode reward: -21.000, mean re
  12192/250000: episode: 13, duration: 1.946s, episode steps: 879, steps per second: 452, episode reward: -21.000, mean re
  13262/250000: episode: 14, duration: 2.332s, episode steps: 1070, steps per second: 459, episode reward: -19.000, mean r
  14135/250000: episode: 15, duration: 1.937s, episode steps: 873, steps per second: 451, episode reward: -20.000, mean re
  15019/250000: episode: 16, duration: 1.906s, episode steps: 884, steps per second: 464, episode reward: -21.000, mean re
  16028/250000: episode: 17, duration: 2.194s, episode steps: 1009, steps per second: 460, episode reward: -19.000, mean r
  17093/250000: episode: 18, duration: 2.316s, episode steps: 1065, steps per second: 460, episode reward: -20.000, mean r
  18024/250000: episode: 19, duration: 2.055s, episode steps: 931, steps per second: 453, episode reward: -20.000, mean re
  18912/250000: episode: 20, duration: 1.992s, episode steps: 888, steps per second: 446, episode reward: -21.000, mean re
  19754/250000: episode: 21, duration: 1.853s, episode steps: 842, steps per second: 454, episode reward: -20.000, mean re
  20537/250000: episode: 22, duration: 1.754s, episode steps: 783, steps per second: 446, episode reward: -21.000, mean re
  21439/250000: episode: 23, duration: 2.010s, episode steps: 902, steps per second: 449, episode reward: -20.000, mean re
  22283/250000: episode: 24, duration: 1.882s, episode steps: 844, steps per second: 448, episode reward: -21.000, mean re
  23242/250000: episode: 25, duration: 2.088s, episode steps: 959, steps per second: 459, episode reward: -20.000, mean re
  24112/250000: episode: 26, duration: 1.893s, episode steps: 870, steps per second: 460, episode reward: -20.000, mean re
  24932/250000: episode: 27, duration: 1.922s, episode steps: 820, steps per second: 427, episode reward: -21.000, mean re
  25752/250000: episode: 28, duration: 1.841s, episode steps: 820, steps per second: 445, episode reward: -21.000, mean re
  26596/250000: episode: 29, duration: 1.908s, episode steps: 844, steps per second: 442, episode reward: -21.000, mean re
  27559/250000: episode: 30, duration: 2.213s, episode steps: 963, steps per second: 435, episode reward: -20.000, mean re
  28481/250000: episode: 31, duration: 2.096s, episode steps: 922, steps per second: 440, episode reward: -20.000, mean re
  29305/250000: episode: 32, duration: 1.889s, episode steps: 824, steps per second: 436, episode reward: -21.000, mean re
  30254/250000: episode: 33, duration: 2.127s, episode steps: 949, steps per second: 446, episode reward: -19.000, mean re
  31080/250000: episode: 34, duration: 1.890s, episode steps: 826, steps per second: 437, episode reward: -21.000, mean re
  32011/250000: episode: 35, duration: 1.975s, episode steps: 931, steps per second: 471, episode reward: -20.000, mean re
  32943/250000: episode: 36, duration: 1.984s, episode steps: 932, steps per second: 470, episode reward: -20.000, mean re
  33864/250000: episode: 37, duration: 1.940s, episode steps: 921, steps per second: 475, episode reward: -20.000, mean re
  34647/250000: episode: 38, duration: 1.708s, episode steps: 783, steps per second: 458, episode reward: -21.000, mean re
  35454/250000: episode: 39, duration: 1.755s, episode steps: 807, steps per second: 460, episode reward: -21.000, mean re
  36278/250000: episode: 40, duration: 1.784s, episode steps: 824, steps per second: 462, episode reward: -21.000, mean re
  37183/250000: episode: 41, duration: 2.006s, episode steps: 905, steps per second: 451, episode reward: -21.000, mean re
  38025/250000: episode: 42, duration: 1.800s, episode steps: 842, steps per second: 468, episode reward: -20.000, mean re
  38808/250000: episode: 43, duration: 1.708s, episode steps: 783, steps per second: 458, episode reward: -21.000, mean re
  39696/250000: episode: 44, duration: 1.915s, episode steps: 888, steps per second: 464, episode reward: -21.000, mean re
  40520/250000: episode: 45, duration: 1.819s, episode steps: 824, steps per second: 453, episode reward: -21.000, mean re
  41312/250000: episode: 46, duration: 1.739s, episode steps: 792, steps per second: 456, episode reward: -21.000, mean re
  42150/250000: episode: 47, duration: 1.853s, episode steps: 838, steps per second: 452, episode reward: -20.000, mean re
  42974/250000: episode: 48, duration: 1.810s, episode steps: 824, steps per second: 455, episode reward: -21.000, mean re
  43816/250000: episode: 49, duration: 1.793s, episode steps: 842, steps per second: 470, episode reward: -20.000, mean re
  44848/250000: episode: 50, duration: 2.253s, episode steps: 1032, steps per second: 458, episode reward: -19.000, mean r
  45691/250000: episode: 51, duration: 1.826s, episode steps: 843, steps per second: 462, episode reward: -20.000, mean re
  46579/250000: episode: 52, duration: 1.935s, episode steps: 888, steps per second: 459, episode reward: -21.000, mean re
  47450/250000: episode: 53, duration: 1.869s, episode steps: 871, steps per second: 466, episode reward: -20.000, mean re
  48233/250000: episode: 54, duration: 1.700s, episode steps: 783, steps per second: 461, episode reward: -21.000, mean re
  49075/250000: episode: 55, duration: 1.823s, episode steps: 842, steps per second: 462, episode reward: -20.000, mean re
  49919/250000: episode: 56, duration: 1.867s, episode steps: 844, steps per second: 452, episode reward: -20.000, mean re
  50903/250000: episode: 57, duration: 6.010s, episode steps: 984, steps per second: 164, episode reward: -19.000, mean re
  51908/250000: episode: 58, duration: 5.386s, episode steps: 1005, steps per second: 187, episode reward: -19.000, mean r
  52871/250000: episode: 59, duration: 5.114s, episode steps: 963, steps per second: 188, episode reward: -21.000, mean re
  53756/250000: episode: 60, duration: 4.725s, episode steps: 885, steps per second: 187, episode reward: -20.000, mean re
  54520/250000: episode: 61, duration: 4.099s, episode steps: 764, steps per second: 186, episode reward: -21.000, mean re
  55441/250000: episode: 62, duration: 4.961s, episode steps: 921, steps per second: 186, episode reward: -20.000, mean re
  56205/250000: episode: 63, duration: 4.122s, episode steps: 764, steps per second: 185, episode reward: -21.000, mean re
  56997/250000: episode: 64, duration: 4.313s, episode steps: 792, steps per second: 184, episode reward: -21.000, mean re
  57946/250000: episode: 65, duration: 5.021s, episode steps: 949, steps per second: 189, episode reward: -20.000, mean re
  58710/250000: episode: 66, duration: 4.049s, episode steps: 764, steps per second: 189, episode reward: -21.000, mean re
  59594/250000: episode: 67, duration: 4.719s, episode steps: 884, steps per second: 187, episode reward: -21.000, mean re
  60556/250000: episode: 68, duration: 5.134s, episode steps: 962, steps per second: 187, episode reward: -20.000, mean re
  61394/250000: episode: 69, duration: 4.510s, episode steps: 838, steps per second: 186, episode reward: -20.000, mean re
  62400/250000: episode: 70, duration: 5.350s, episode steps: 1006, steps per second: 188, episode reward: -19.000, mean r
  63303/250000: episode: 71, duration: 4.782s, episode steps: 903, steps per second: 189, episode reward: -21.000, mean re
  64217/250000: episode: 72, duration: 4.864s, episode steps: 914, steps per second: 188, episode reward: -21.000, mean re
  65009/250000: episode: 73, duration: 4.170s, episode steps: 792, steps per second: 190, episode reward: -21.000, mean re
  65893/250000: episode: 74, duration: 4.665s, episode steps: 884, steps per second: 190, episode reward: -21.000, mean re
  66735/250000: episode: 75, duration: 4.492s, episode steps: 842, steps per second: 187, episode reward: -20.000, mean re
  67951/250000: episode: 76, duration: 6.475s, episode steps: 1216, steps per second: 188, episode reward: -18.000, mean r
  68868/250000: episode: 77, duration: 4.894s, episode steps: 917, steps per second: 187, episode reward: -21.000, mean re
  69692/250000: episode: 78, duration: 4.398s, episode steps: 824, steps per second: 187, episode reward: -21.000, mean re
  70534/250000: episode: 79, duration: 4.498s, episode steps: 842, steps per second: 187, episode reward: -20.000, mean re
  71418/250000: episode: 80, duration: 4.724s, episode steps: 884, steps per second: 187, episode reward: -21.000, mean re
  72330/250000: episode: 81, duration: 4.861s, episode steps: 912, steps per second: 188, episode reward: -21.000, mean re
  73094/250000: episode: 82, duration: 4.019s, episode steps: 764, steps per second: 190, episode reward: -21.000, mean re
  73948/250000: episode: 83, duration: 4.542s, episode steps: 854, steps per second: 188, episode reward: -21.000, mean re
  74814/250000: episode: 84, duration: 4.573s, episode steps: 866, steps per second: 189, episode reward: -20.000, mean re
  75638/250000: episode: 85, duration: 4.314s, episode steps: 824, steps per second: 191, episode reward: -21.000, mean re
  76556/250000: episode: 86, duration: 4.893s, episode steps: 918, steps per second: 188, episode reward: -20.000, mean re
  77320/250000: episode: 87, duration: 4.023s, episode steps: 764, steps per second: 190, episode reward: -21.000, mean re
  78253/250000: episode: 88, duration: 4.947s, episode steps: 933, steps per second: 189, episode reward: -20.000, mean re
  79036/250000: episode: 89, duration: 4.170s, episode steps: 783, steps per second: 188, episode reward: -21.000, mean re
  79860/250000: episode: 90, duration: 4.545s, episode steps: 824, steps per second: 181, episode reward: -21.000, mean re
  80702/250000: episode: 91, duration: 4.526s, episode steps: 842, steps per second: 186, episode reward: -20.000, mean re
  81504/250000: episode: 92, duration: 4.253s, episode steps: 802, steps per second: 189, episode reward: -21.000, mean re
  82328/250000: episode: 93, duration: 4.387s, episode steps: 824, steps per second: 188, episode reward: -21.000, mean re
```

```
 83212/250000: episode: 94, duration: 4.725s, episode steps: 884, steps per second: 187, episode reward: -21.000, mean re
 83976/250000: episode: 95, duration: 4.066s, episode steps: 764, steps per second: 188, episode reward: -21.000, mean re
 85127/250000: episode: 96, duration: 6.111s, episode steps: 1151, steps per second: 188, episode reward: -19.000, mean r
 85891/250000: episode: 97, duration: 4.136s, episode steps: 764, steps per second: 185, episode reward: -21.000, mean re
 86655/250000: episode: 98, duration: 4.079s, episode steps: 764, steps per second: 187, episode reward: -21.000, mean re
 87631/250000: episode: 99, duration: 5.173s, episode steps: 976, steps per second: 189, episode reward: -19.000, mean re
 88395/250000: episode: 100, duration: 4.066s, episode steps: 764, steps per second: 188, episode reward: -21.000, mean r
 89219/250000: episode: 101, duration: 4.386s, episode steps: 824, steps per second: 188, episode reward: -21.000, mean r
 90044/250000: episode: 102, duration: 4.381s, episode steps: 825, steps per second: 188, episode reward: -21.000, mean r
 90808/250000: episode: 103, duration: 4.093s, episode steps: 764, steps per second: 187, episode reward: -21.000, mean r
 91713/250000: episode: 104, duration: 4.834s, episode steps: 905, steps per second: 187, episode reward: -20.000, mean r
 92659/250000: episode: 105, duration: 4.959s, episode steps: 946, steps per second: 191, episode reward: -21.000, mean r
 93692/250000: episode: 106, duration: 5.453s, episode steps: 1033, steps per second: 189, episode reward: -21.000, mean
 94536/250000: episode: 107, duration: 4.447s, episode steps: 844, steps per second: 190, episode reward: -20.000, mean r
 95588/250000: episode: 108, duration: 5.542s, episode steps: 1052, steps per second: 190, episode reward: -21.000, mean
 96352/250000: episode: 109, duration: 4.025s, episode steps: 764, steps per second: 190, episode reward: -21.000, mean r
 97116/250000: episode: 110, duration: 4.029s, episode steps: 764, steps per second: 190, episode reward: -21.000, mean r
 98182/250000: episode: 111, duration: 5.755s, episode steps: 1066, steps per second: 185, episode reward: -21.000, mean
 99129/250000: episode: 112, duration: 5.135s, episode steps: 947, steps per second: 184, episode reward: -21.000, mean r
 99953/250000: episode: 113, duration: 4.331s, episode steps: 824, steps per second: 190, episode reward: -21.000, mean r
100807/250000: episode: 114, duration: 4.490s, episode steps: 854, steps per second: 190, episode reward: -21.000, mean r
101645/250000: episode: 115, duration: 4.418s, episode steps: 838, steps per second: 190, episode reward: -20.000, mean r
102760/250000: episode: 116, duration: 5.833s, episode steps: 1115, steps per second: 191, episode reward: -19.000, mean
103524/250000: episode: 117, duration: 4.016s, episode steps: 764, steps per second: 190, episode reward: -21.000, mean r
104408/250000: episode: 118, duration: 4.590s, episode steps: 884, steps per second: 193, episode reward: -21.000, mean r
105292/250000: episode: 119, duration: 4.633s, episode steps: 884, steps per second: 191, episode reward: -21.000, mean r
106236/250000: episode: 120, duration: 5.012s, episode steps: 944, steps per second: 188, episode reward: -21.000, mean r
107433/250000: episode: 121, duration: 6.240s, episode steps: 1197, steps per second: 192, episode reward: -19.000, mean
108197/250000: episode: 122, duration: 3.997s, episode steps: 764, steps per second: 191, episode reward: -21.000, mean r
109037/250000: episode: 123, duration: 4.376s, episode steps: 840, steps per second: 192, episode reward: -21.000, mean r
110035/250000: episode: 124, duration: 5.248s, episode steps: 998, steps per second: 190, episode reward: -19.000, mean r
111071/250000: episode: 125, duration: 5.459s, episode steps: 1036, steps per second: 190, episode reward: -21.000, mean
111994/250000: episode: 126, duration: 4.804s, episode steps: 923, steps per second: 192, episode reward: -19.000, mean r
112818/250000: episode: 127, duration: 4.285s, episode steps: 824, steps per second: 192, episode reward: -21.000, mean r
113670/250000: episode: 128, duration: 4.493s, episode steps: 852, steps per second: 190, episode reward: -21.000, mean r
114646/250000: episode: 129, duration: 5.167s, episode steps: 976, steps per second: 189, episode reward: -21.000, mean r
115654/250000: episode: 130, duration: 5.282s, episode steps: 1008, steps per second: 191, episode reward: -20.000, mean
116617/250000: episode: 131, duration: 5.054s, episode steps: 963, steps per second: 191, episode reward: -20.000, mean r
117728/250000: episode: 132, duration: 5.864s, episode steps: 1111, steps per second: 189, episode reward: -20.000, mean
118735/250000: episode: 133, duration: 5.195s, episode steps: 1007, steps per second: 194, episode reward: -21.000, mean
119618/250000: episode: 134, duration: 4.636s, episode steps: 883, steps per second: 190, episode reward: -21.000, mean r
120686/250000: episode: 135, duration: 5.555s, episode steps: 1068, steps per second: 192, episode reward: -21.000, mean
121568/250000: episode: 136, duration: 4.617s, episode steps: 882, steps per second: 191, episode reward: -21.000, mean r
122623/250000: episode: 137, duration: 5.492s, episode steps: 1055, steps per second: 192, episode reward: -21.000, mean
123535/250000: episode: 138, duration: 4.728s, episode steps: 912, steps per second: 193, episode reward: -21.000, mean r
124528/250000: episode: 139, duration: 5.166s, episode steps: 993, steps per second: 192, episode reward: -21.000, mean r
125380/250000: episode: 140, duration: 4.445s, episode steps: 852, steps per second: 192, episode reward: -21.000, mean r
126703/250000: episode: 141, duration: 6.883s, episode steps: 1323, steps per second: 192, episode reward: -20.000, mean
127616/250000: episode: 142, duration: 4.804s, episode steps: 913, steps per second: 190, episode reward: -21.000, mean r
128576/250000: episode: 143, duration: 5.009s, episode steps: 960, steps per second: 192, episode reward: -20.000, mean r
129732/250000: episode: 144, duration: 6.078s, episode steps: 1156, steps per second: 190, episode reward: -20.000, mean
130662/250000: episode: 145, duration: 4.840s, episode steps: 930, steps per second: 192, episode reward: -21.000, mean r
131731/250000: episode: 146, duration: 5.616s, episode steps: 1069, steps per second: 190, episode reward: -20.000, mean
132585/250000: episode: 147, duration: 4.473s, episode steps: 854, steps per second: 191, episode reward: -21.000, mean r
133477/250000: episode: 148, duration: 4.677s, episode steps: 892, steps per second: 191, episode reward: -21.000, mean r
134363/250000: episode: 149, duration: 4.651s, episode steps: 886, steps per second: 191, episode reward: -21.000, mean r
135298/250000: episode: 150, duration: 4.889s, episode steps: 935, steps per second: 191, episode reward: -21.000, mean r
136249/250000: episode: 151, duration: 5.002s, episode steps: 951, steps per second: 190, episode reward: -20.000, mean r
137286/250000: episode: 152, duration: 5.516s, episode steps: 1037, steps per second: 188, episode reward: -20.000, mean
138235/250000: episode: 153, duration: 5.074s, episode steps: 949, steps per second: 187, episode reward: -20.000, mean r
139077/250000: episode: 154, duration: 4.459s, episode steps: 842, steps per second: 189, episode reward: -20.000, mean r
139957/250000: episode: 155, duration: 4.676s, episode steps: 880, steps per second: 188, episode reward: -21.000, mean r
140841/250000: episode: 156, duration: 4.690s, episode steps: 884, steps per second: 188, episode reward: -21.000, mean r
141665/250000: episode: 157, duration: 4.357s, episode steps: 824, steps per second: 189, episode reward: -21.000, mean r
142485/250000: episode: 158, duration: 4.367s, episode steps: 820, steps per second: 188, episode reward: -21.000, mean r
143497/250000: episode: 159, duration: 5.332s, episode steps: 1012, steps per second: 190, episode reward: -19.000, mean
144594/250000: episode: 160, duration: 5.695s, episode steps: 1097, steps per second: 193, episode reward: -18.000, mean
145625/250000: episode: 161, duration: 5.439s, episode steps: 1031, steps per second: 190, episode reward: -19.000, mean
146768/250000: episode: 162, duration: 6.023s, episode steps: 1143, steps per second: 190, episode reward: -19.000, mean
147620/250000: episode: 163, duration: 4.502s, episode steps: 852, steps per second: 189, episode reward: -21.000, mean r
148599/250000: episode: 164, duration: 5.092s, episode steps: 979, steps per second: 192, episode reward: -19.000, mean r
149479/250000: episode: 165, duration: 4.601s, episode steps: 880, steps per second: 191, episode reward: -21.000, mean r
150497/250000: episode: 166, duration: 5.323s, episode steps: 1018, steps per second: 191, episode reward: -20.000, mean
151373/250000: episode: 167, duration: 4.641s, episode steps: 876, steps per second: 189, episode reward: -21.000, mean r
152272/250000: episode: 168, duration: 4.707s, episode steps: 899, steps per second: 191, episode reward: -21.000, mean r
153319/250000: episode: 169, duration: 5.509s, episode steps: 1047, steps per second: 190, episode reward: -19.000, mean
154334/250000: episode: 170, duration: 5.266s, episode steps: 1015, steps per second: 193, episode reward: -20.000, mean
155241/250000: episode: 171, duration: 4.718s, episode steps: 907, steps per second: 192, episode reward: -21.000, mean r
156150/250000: episode: 172, duration: 4.730s, episode steps: 909, steps per second: 192, episode reward: -21.000, mean r
157276/250000: episode: 173, duration: 6.162s, episode steps: 1126, steps per second: 183, episode reward: -20.000, mean
158277/250000: episode: 174, duration: 5.440s, episode steps: 1001, steps per second: 184, episode reward: -20.000, mean
159596/250000: episode: 175, duration: 6.857s, episode steps: 1319, steps per second: 192, episode reward: -18.000, mean
160603/250000: episode: 176, duration: 5.257s, episode steps: 1007, steps per second: 192, episode reward: -19.000, mean
161555/250000: episode: 177, duration: 4.940s, episode steps: 952, steps per second: 193, episode reward: -20.000, mean r
162649/250000: episode: 178, duration: 5.788s, episode steps: 1094, steps per second: 189, episode reward: -18.000, mean
163696/250000: episode: 179, duration: 5.475s, episode steps: 1047, steps per second: 191, episode reward: -20.000, mean
164762/250000: episode: 180, duration: 5.588s, episode steps: 1066, steps per second: 191, episode reward: -20.000, mean
165603/250000: episode: 181, duration: 4.386s, episode steps: 841, steps per second: 192, episode reward: -21.000, mean r
166602/250000: episode: 182, duration: 5.161s, episode steps: 999, steps per second: 194, episode reward: -20.000, mean r
167473/250000: episode: 183, duration: 4.546s, episode steps: 871, steps per second: 192, episode reward: -21.000, mean r
168617/250000: episode: 184, duration: 5.999s, episode steps: 1144, steps per second: 191, episode reward: -18.000, mean
169643/250000: episode: 185, duration: 5.368s, episode steps: 1026, steps per second: 191, episode reward: -19.000, mean
170523/250000: episode: 186, duration: 4.609s, episode steps: 880, steps per second: 191, episode reward: -21.000, mean r
171619/250000: episode: 187, duration: 5.706s, episode steps: 1096, steps per second: 192, episode reward: -21.000, mean
172677/250000: episode: 188, duration: 5.492s, episode steps: 1058, steps per second: 193, episode reward: -21.000, mean
```
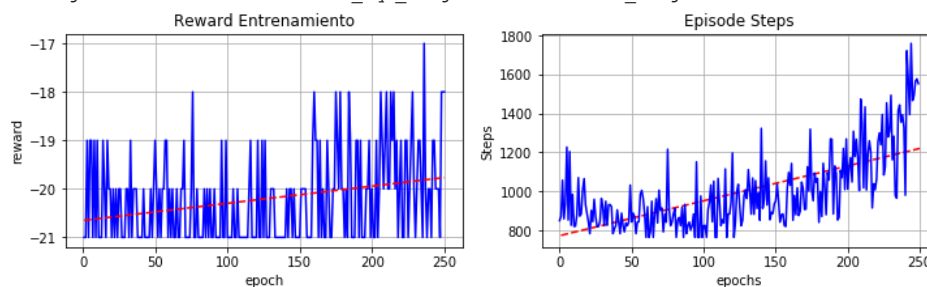
```
173946/250000: episode: 189, duration: 6.599s, episode steps: 1269, steps per second: 192, episode reward: -19.000, mean
175213/250000: episode: 190, duration: 6.644s, episode steps: 1267, steps per second: 191, episode reward: -19.000, mean
176097/250000: episode: 191, duration: 4.622s, episode steps: 884, steps per second: 191, episode reward: -21.000, mean r
177227/250000: episode: 192, duration: 5.893s, episode steps: 1130, steps per second: 192, episode reward: -19.000, mean
178319/250000: episode: 193, duration: 5.716s, episode steps: 1092, steps per second: 191, episode reward: -21.000, mean
179172/250000: episode: 194, duration: 4.421s, episode steps: 853, steps per second: 193, episode reward: -21.000, mean r
180039/250000: episode: 195, duration: 4.531s, episode steps: 867, steps per second: 191, episode reward: -21.000, mean r
181147/250000: episode: 196, duration: 5.777s, episode steps: 1108, steps per second: 192, episode reward: -20.000, mean
182217/250000: episode: 197, duration: 5.576s, episode steps: 1070, steps per second: 192, episode reward: -20.000, mean
183437/250000: episode: 198, duration: 6.382s, episode steps: 1220, steps per second: 191, episode reward: -19.000, mean
184446/250000: episode: 199, duration: 5.250s, episode steps: 1009, steps per second: 192, episode reward: -21.000, mean
185715/250000: episode: 200, duration: 6.608s, episode steps: 1269, steps per second: 192, episode reward: -20.000, mean
186726/250000: episode: 201, duration: 5.318s, episode steps: 1011, steps per second: 190, episode reward: -21.000, mean
187847/250000: episode: 202, duration: 5.870s, episode steps: 1121, steps per second: 191, episode reward: -21.000, mean
189020/250000: episode: 203, duration: 6.066s, episode steps: 1173, steps per second: 193, episode reward: -19.000, mean
190068/250000: episode: 204, duration: 5.446s, episode steps: 1048, steps per second: 192, episode reward: -21.000, mean
191376/250000: episode: 205, duration: 6.803s, episode steps: 1308, steps per second: 192, episode reward: -20.000, mean
192555/250000: episode: 206, duration: 6.199s, episode steps: 1179, steps per second: 190, episode reward: -18.000, mean
193822/250000: episode: 207, duration: 6.690s, episode steps: 1267, steps per second: 189, episode reward: -19.000, mean
194991/250000: episode: 208, duration: 6.094s, episode steps: 1169, steps per second: 192, episode reward: -20.000, mean
195995/250000: episode: 209, duration: 5.306s, episode steps: 1004, steps per second: 189, episode reward: -19.000, mean
197468/250000: episode: 210, duration: 7.655s, episode steps: 1473, steps per second: 192, episode reward: -18.000, mean
198817/250000: episode: 211, duration: 7.017s, episode steps: 1349, steps per second: 192, episode reward: -20.000, mean
199835/250000: episode: 212, duration: 5.291s, episode steps: 1018, steps per second: 192, episode reward: -20.000, mean
201268/250000: episode: 213, duration: 7.410s, episode steps: 1433, steps per second: 193, episode reward: -18.000, mean
202275/250000: episode: 214, duration: 5.264s, episode steps: 1007, steps per second: 191, episode reward: -19.000, mean
203466/250000: episode: 215, duration: 6.244s, episode steps: 1191, steps per second: 191, episode reward: -18.000, mean
204725/250000: episode: 216, duration: 6.599s, episode steps: 1259, steps per second: 191, episode reward: -20.000, mean
205927/250000: episode: 217, duration: 6.257s, episode steps: 1202, steps per second: 192, episode reward: -19.000, mean
206842/250000: episode: 218, duration: 4.758s, episode steps: 915, steps per second: 192, episode reward: -21.000, mean r
207881/250000: episode: 219, duration: 5.457s, episode steps: 1039, steps per second: 190, episode reward: -20.000, mean
208889/250000: episode: 220, duration: 5.338s, episode steps: 1008, steps per second: 189, episode reward: -19.000, mean
209951/250000: episode: 221, duration: 5.570s, episode steps: 1062, steps per second: 191, episode reward: -21.000, mean
211206/250000: episode: 222, duration: 6.582s, episode steps: 1255, steps per second: 191, episode reward: -21.000, mean
212506/250000: episode: 223, duration: 6.780s, episode steps: 1300, steps per second: 192, episode reward: -19.000, mean
213745/250000: episode: 224, duration: 6.456s, episode steps: 1239, steps per second: 192, episode reward: -19.000, mean
215139/250000: episode: 225, duration: 7.181s, episode steps: 1394, steps per second: 194, episode reward: -21.000, mean
216223/250000: episode: 226, duration: 5.791s, episode steps: 1084, steps per second: 187, episode reward: -20.000, mean
217349/250000: episode: 227, duration: 6.094s, episode steps: 1126, steps per second: 185, episode reward: -19.000, mean
218803/250000: episode: 228, duration: 7.543s, episode steps: 1454, steps per second: 193, episode reward: -18.000, mean
220082/250000: episode: 229, duration: 6.608s, episode steps: 1279, steps per second: 194, episode reward: -20.000, mean
221392/250000: episode: 230, duration: 6.793s, episode steps: 1310, steps per second: 193, episode reward: -21.000, mean
222885/250000: episode: 231, duration: 7.796s, episode steps: 1493, steps per second: 192, episode reward: -20.000, mean
224047/250000: episode: 232, duration: 6.088s, episode steps: 1162, steps per second: 191, episode reward: -19.000, mean
225330/250000: episode: 233, duration: 6.661s, episode steps: 1283, steps per second: 193, episode reward: -19.000, mean
226309/250000: episode: 234, duration: 5.051s, episode steps: 979, steps per second: 194, episode reward: -20.000, mean r
227274/250000: episode: 235, duration: 5.030s, episode steps: 965, steps per second: 192, episode reward: -21.000, mean r
228687/250000: episode: 236, duration: 7.281s, episode steps: 1413, steps per second: 194, episode reward: -17.000, mean
230130/250000: episode: 237, duration: 7.473s, episode steps: 1443, steps per second: 193, episode reward: -20.000, mean
231485/250000: episode: 238, duration: 7.079s, episode steps: 1355, steps per second: 191, episode reward: -21.000, mean
232878/250000: episode: 239, duration: 7.277s, episode steps: 1393, steps per second: 191, episode reward: -20.000, mean
234205/250000: episode: 240, duration: 6.906s, episode steps: 1327, steps per second: 192, episode reward: -20.000, mean
235185/250000: episode: 241, duration: 5.118s, episode steps: 980, steps per second: 191, episode reward: -21.000, mean r
236906/250000: episode: 242, duration: 8.957s, episode steps: 1721, steps per second: 192, episode reward: -19.000, mean
238482/250000: episode: 243, duration: 8.190s, episode steps: 1576, steps per second: 192, episode reward: -19.000, mean
239876/250000: episode: 244, duration: 7.305s, episode steps: 1394, steps per second: 191, episode reward: -20.000, mean
241635/250000: episode: 245, duration: 9.325s, episode steps: 1759, steps per second: 189, episode reward: -20.000, mean
243101/250000: episode: 246, duration: 7.640s, episode steps: 1466, steps per second: 192, episode reward: -20.000, mean
244592/250000: episode: 247, duration: 7.764s, episode steps: 1491, steps per second: 192, episode reward: -21.000, mean
246157/250000: episode: 248, duration: 8.158s, episode steps: 1565, steps per second: 192, episode reward: -18.000, mean
247734/250000: episode: 249, duration: 8.211s, episode steps: 1577, steps per second: 192, episode reward: -18.000, mean
249287/250000: episode: 250, duration: 8.098s, episode steps: 1553, steps per second: 192, episode reward: -18.000, mean
done, took 1167.737 seconds
Pesos guardados en: 202001071950_dqn_PongDeterministic-v0_weights.h5f
```



```
Testing for 10 episodes ...
Episode 1: reward: -18.000, steps: 1766
Episode 2: reward: -18.000, steps: 1994
Episode 3: reward: -19.000, steps: 1913
Episode 4: reward: -19.000, steps: 1904
Episode 5: reward: -21.000, steps: 1554
Episode 6: reward: -19.000, steps: 1709
Episode 7: reward: -16.000, steps: 2049
Episode 8: reward: -19.000, steps: 1754
Episode 9: reward: -19.000, steps: 1611
Episode 10: reward: -18.000, steps: 1680
mean reward: -18.6
mean_steps: 1793.4
(-18.6, 1793.4)
```