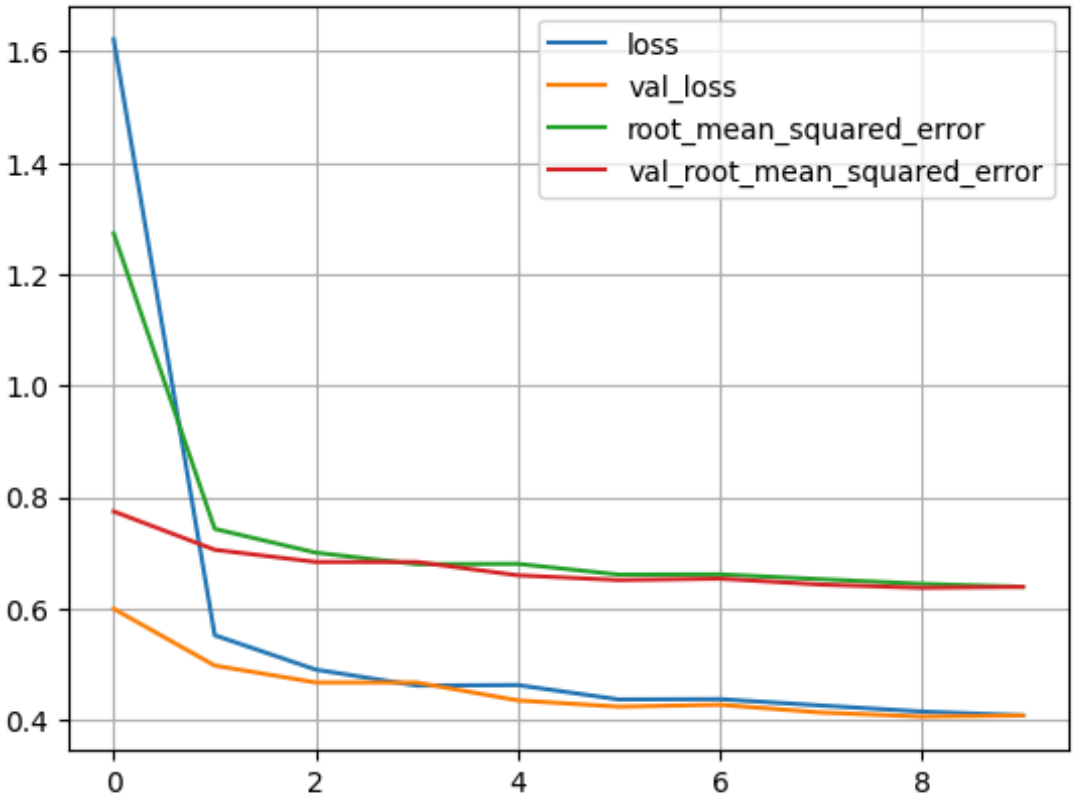
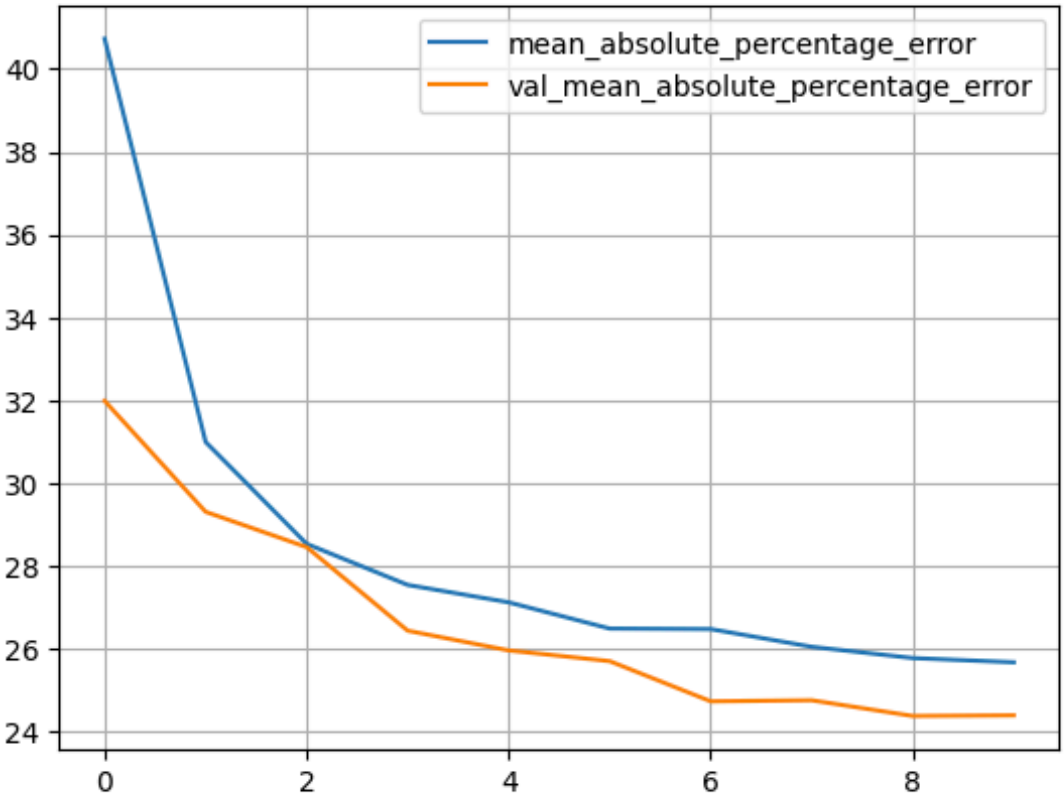
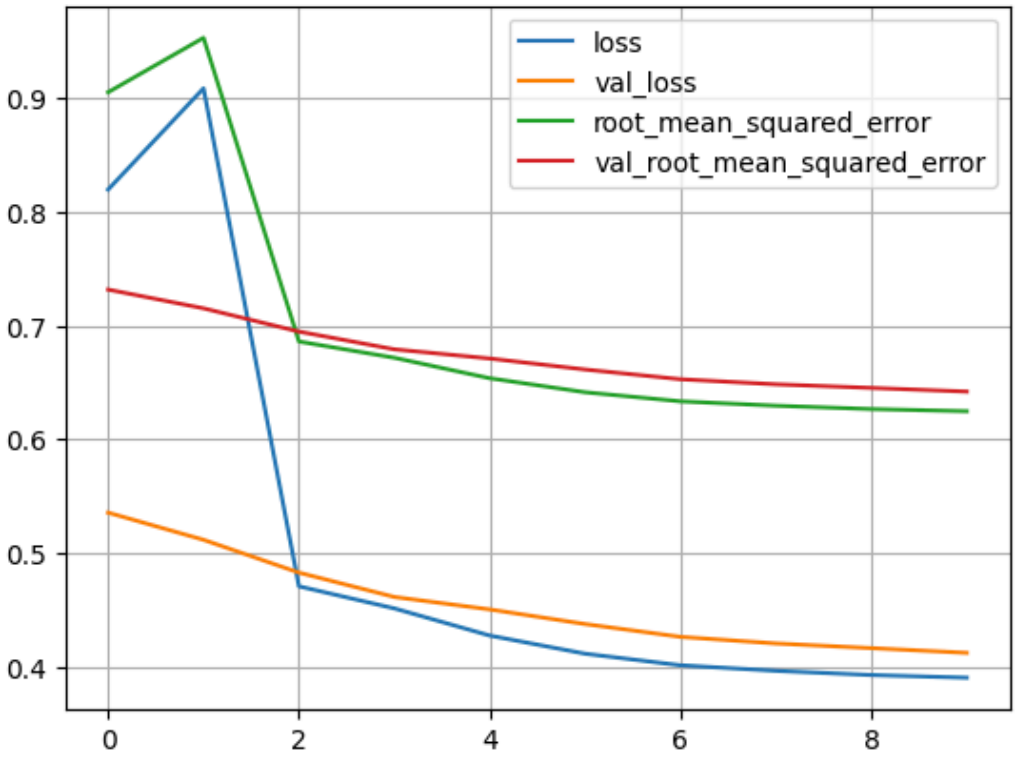
Base

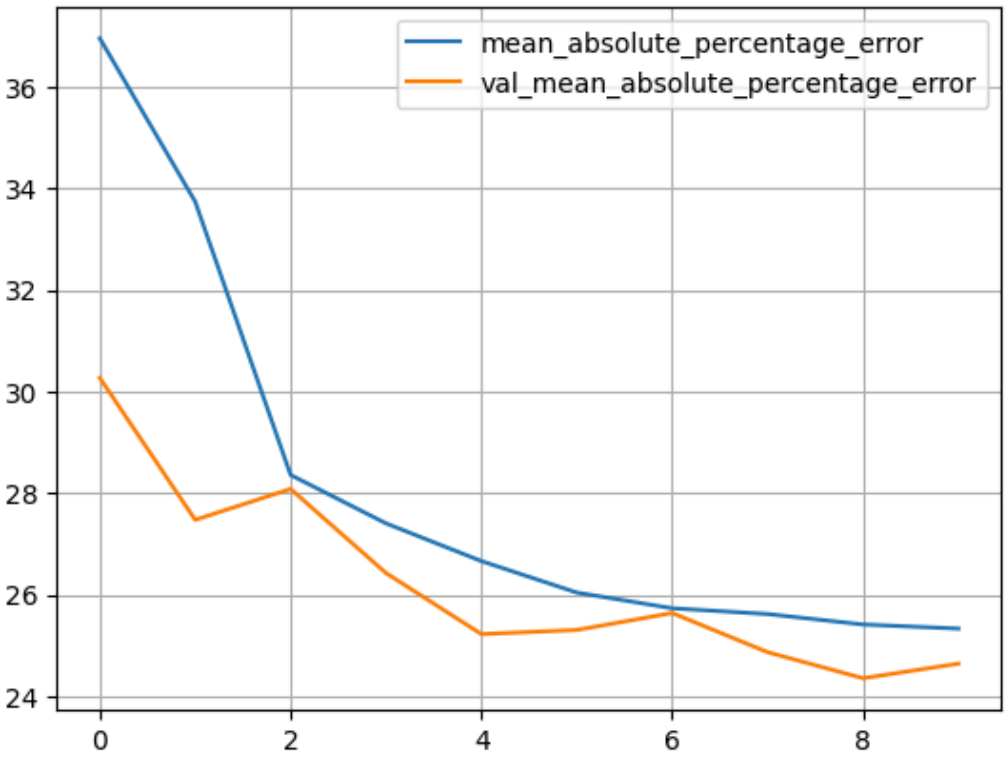

loss
val_loss
root_mean_squared_error
val_root_mean_squared_error
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0
2
4
6
8


mean_absolute_percentage_error
val_mean_absolute_percentage_error
40
38
36
34
32
30
28
26
24
0
2
4
6
8

```
363/363 [==============================] - 1s 2ms/step -
loss: 0.4046 - root_mean_squared_error: 0.6361 -
mean_absolute_percentage_error: 24.7749
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.4045981764793396
root_mean_squared_error train: 0.6360803246498108
mean_absolute_percentage_error train: 24.77491569519043
121/121 [==============================] - 0s 2ms/step -
loss: 0.4083 - root_mean_squared_error: 0.6390 -
mean_absolute_percentage_error: 24.3882
Evaluar el modelo en el conjunto de validacion
loss valid: 0.4083424210548401
root_mean_squared_error valid: 0.6390167474746704
mean_absolute_percentage_error valid: 24.388179779052734
162/162 [==============================] - 0s 2ms/step -
loss: 0.4047 - root_mean_squared_error: 0.6362 -
mean_absolute_percentage_error: 24.9150
Evaluar el modelo en el conjunto de prueba
loss test: 0.40472686290740967
root_mean_squared_error test: 0.6361814737319946
mean_absolute_percentage_error test: 24.914979934692383
```

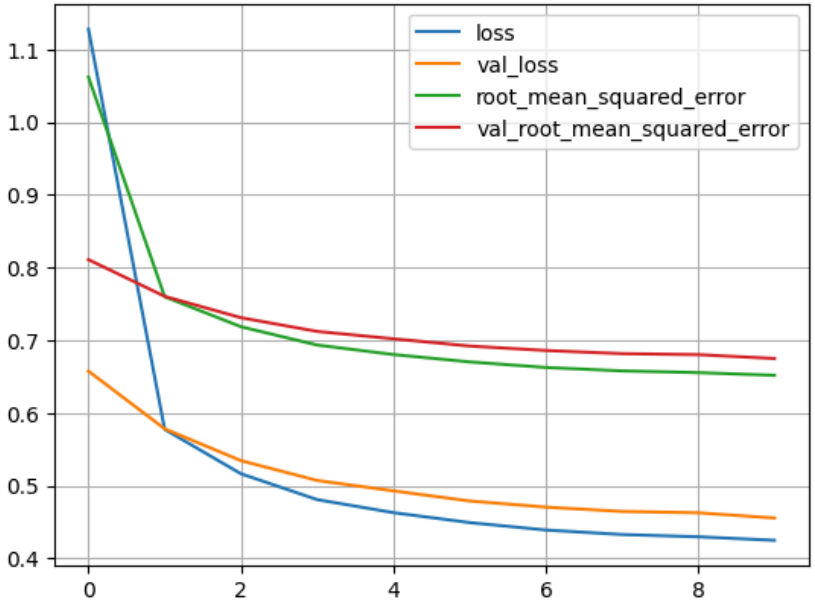
1. **Modifica el numero de neuronas en a capa oculta (60)**

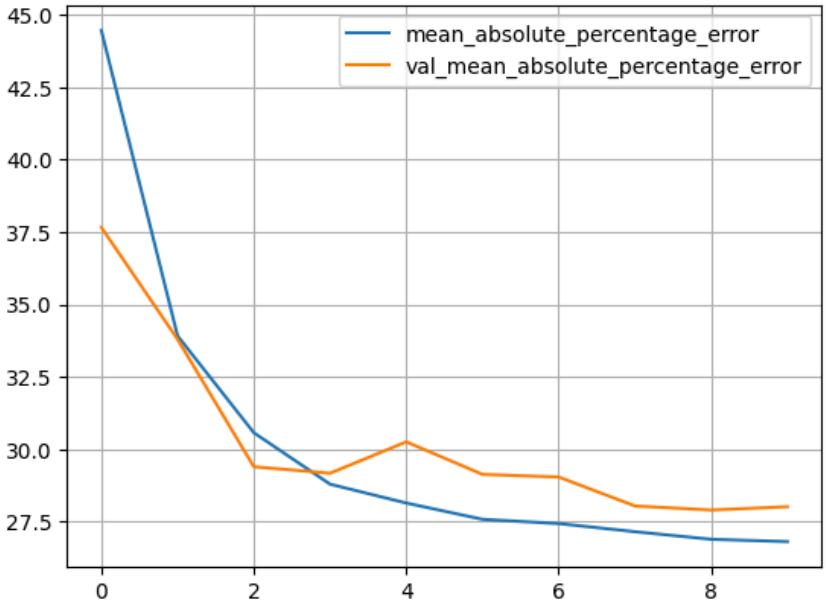




```
363/363 [==============================] - 1s 2ms/step -
loss: 0.3824 - root_mean_squared_error: 0.6184 -
mean_absolute_percentage_error: 25.1887
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.3823709785938263
root_mean_squared_error train: 0.6183615326881409
mean_absolute_percentage_error train: 25.18865966796875
121/121 [==============================] - 0s 2ms/step -
loss: 0.4125 - root_mean_squared_error: 0.6422 -
mean_absolute_percentage_error: 24.6429
Evaluar el modelo en el conjunto de validacion
loss valid: 0.41247376799583435
root_mean_squared_error valid: 0.6422411799430847
mean_absolute_percentage_error valid: 24.642946243286133
162/162 [==============================] - 0s 2ms/step -
loss: 0.3914 - root_mean_squared_error: 0.6256 -
mean_absolute_percentage_error: 24.2458
Evaluar el modelo en el conjunto de prueba
loss test: 0.3914331793785095
root_mean_squared_error test: 0.6256462335586548
mean_absolute_percentage_error test: 24.24577522277832
```

1. Modifica el numero de neuronas en a capa oculta (10)

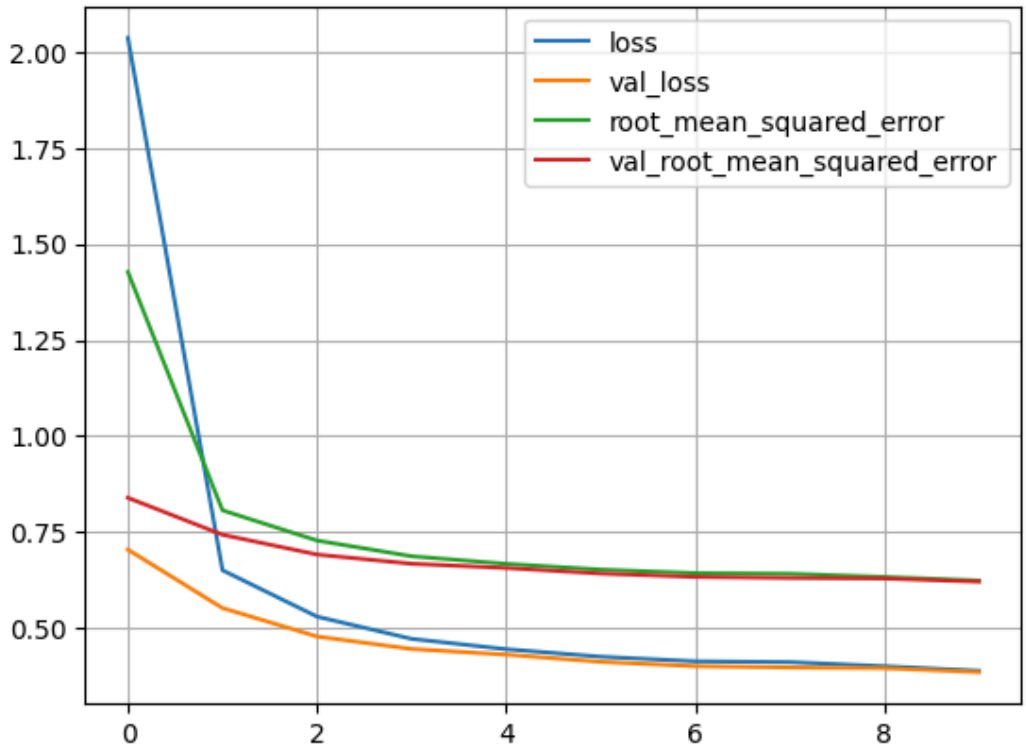


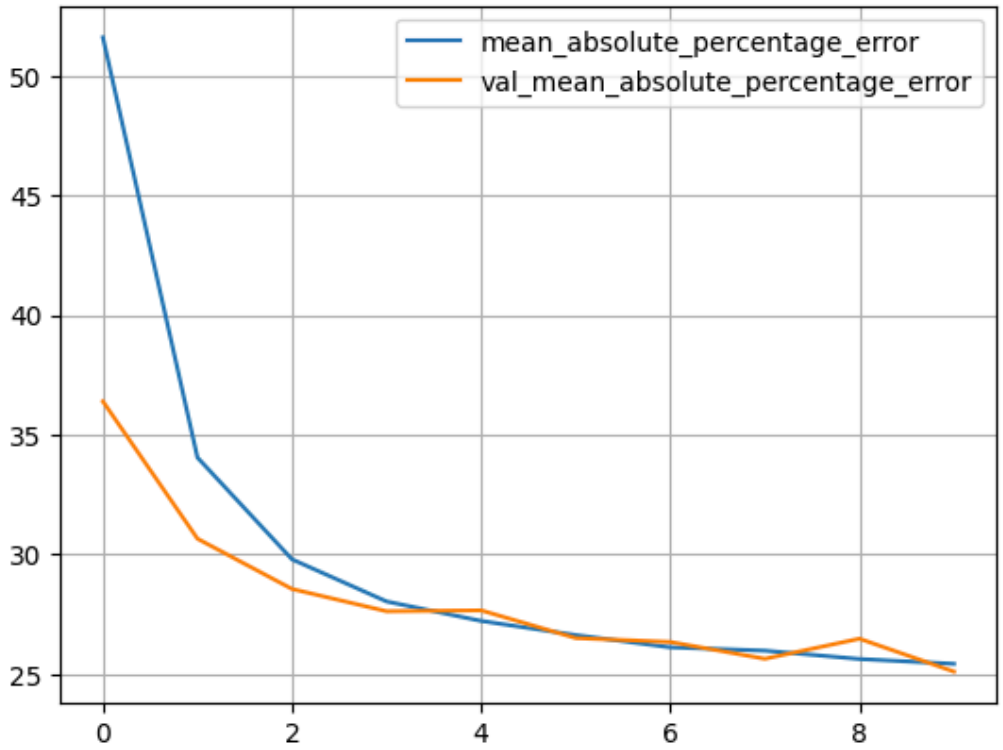



```
363/363 [==============================] - 1s 2ms/step -
loss: 0.4209 - root_mean_squared_error: 0.6488 -
mean_absolute_percentage_error: 26.7530
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.4209262430667877
root_mean_squared_error train: 0.6487882733345032
```

```
mean_absolute_percentage_error train: 26.75299644470215
121/121 [==============================] - 0s 1ms/step -
loss: 0.4555 - root_mean_squared_error: 0.6749 -
mean_absolute_percentage_error: 28.0112
Evaluar el modelo en el conjunto de validacion
loss valid: 0.45550450682640076
root_mean_squared_error valid: 0.6749107241630554
mean_absolute_percentage_error valid: 28.011211395263672
162/162 [==============================] - 0s 2ms/step -
loss: 0.4363 - root_mean_squared_error: 0.6605 -
mean_absolute_percentage_error: 27.1911
Evaluar el modelo en el conjunto de prueba
loss test: 0.4362957179546356
root_mean_squared_error test: 0.6605268716812134
mean_absolute_percentage_error test: 27.191137313842773
```

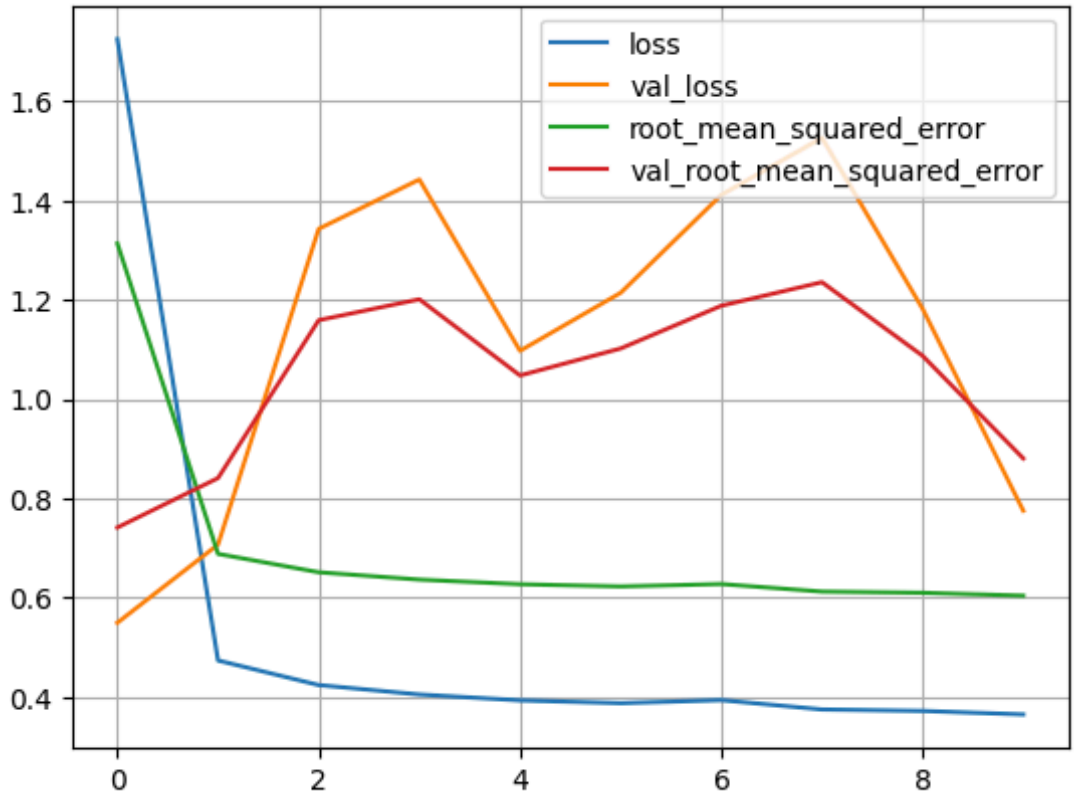
2. Modifica el numero de neuronas en a capa oculta (adam)

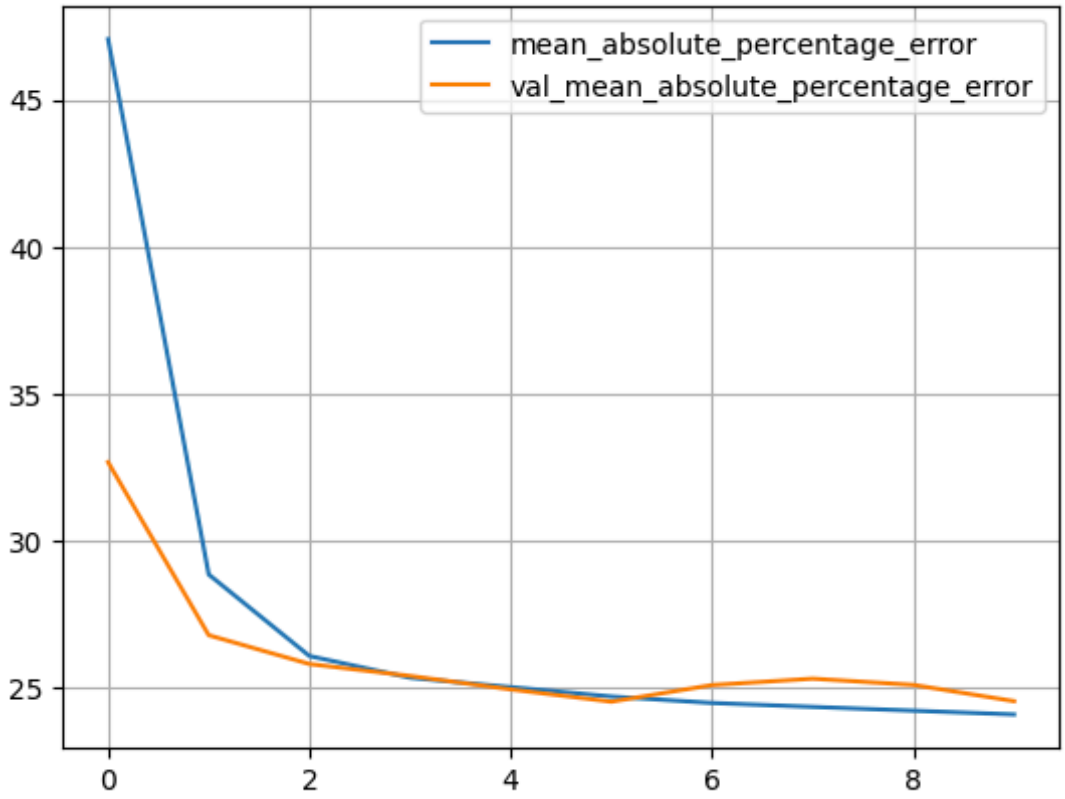




```
363/363 [==============================] - 1s 2ms/step -
loss: 0.3839 - root_mean_squared_error: 0.6196 -
mean_absolute_percentage_error: 24.7133
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.38391825556755066
root_mean_squared_error train: 0.619611382484436
mean_absolute_percentage_error train: 24.713272094726562
121/121 [==============================] - 0s 2ms/step -
loss: 0.3861 - root_mean_squared_error: 0.6213 -
mean_absolute_percentage_error: 25.1061
Evaluar el modelo en el conjunto de validacion
loss valid: 0.38605260848999023
root_mean_squared_error valid: 0.6213313341140747
mean_absolute_percentage_error valid: 25.106077194213867
162/162 [==============================] - 0s 3ms/step -
loss: 0.3672 - root_mean_squared_error: 0.6060 -
mean_absolute_percentage_error: 24.1925
Evaluar el modelo en el conjunto de prueba
loss test: 0.36722129583358765
root_mean_squared_error test: 0.6059878468513489
mean_absolute_percentage_error test: 24.192527770996094
```

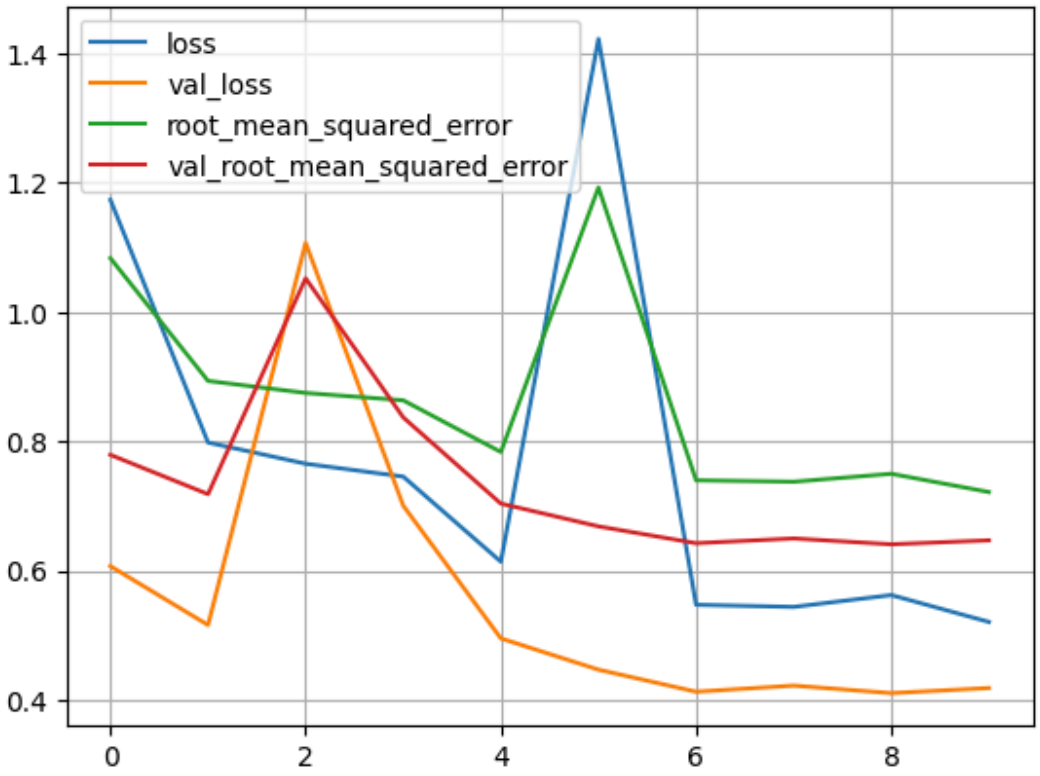
2. Modifica el numero de neuronas en a capa oculta (rmsprop)

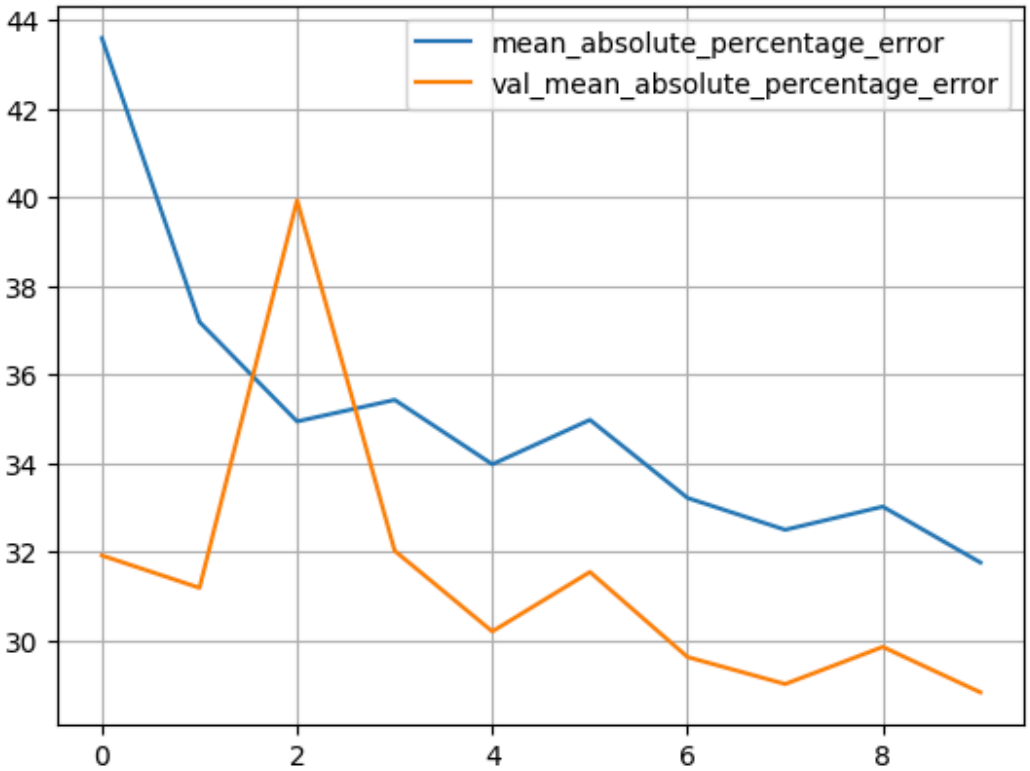




```
363/363 [==============================] - 1s 3ms/step -
loss: 0.3555 - root_mean_squared_error: 0.5962 -
mean_absolute_percentage_error: 23.8426
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.3555106520652771
root_mean_squared_error train: 0.596247136592865
mean_absolute_percentage_error train: 23.84255027770996
121/121 [==============================] - 0s 2ms/step -
loss: 0.7750 - root_mean_squared_error: 0.8803 -
mean_absolute_percentage_error: 24.5280
Evaluar el modelo en el conjunto de validacion
loss valid: 0.7749561071395874
root_mean_squared_error valid: 0.880315899848938
mean_absolute_percentage_error valid: 24.527971267700195
162/162 [==============================] - 0s 2ms/step -
loss: 0.4979 - root_mean_squared_error: 0.7056 -
mean_absolute_percentage_error: 25.6088
Evaluar el modelo en el conjunto de prueba
loss test: 0.4979163706302643
root_mean_squared_error test: 0.7056319117546082
mean_absolute_percentage_error test: 25.60881996154785
```

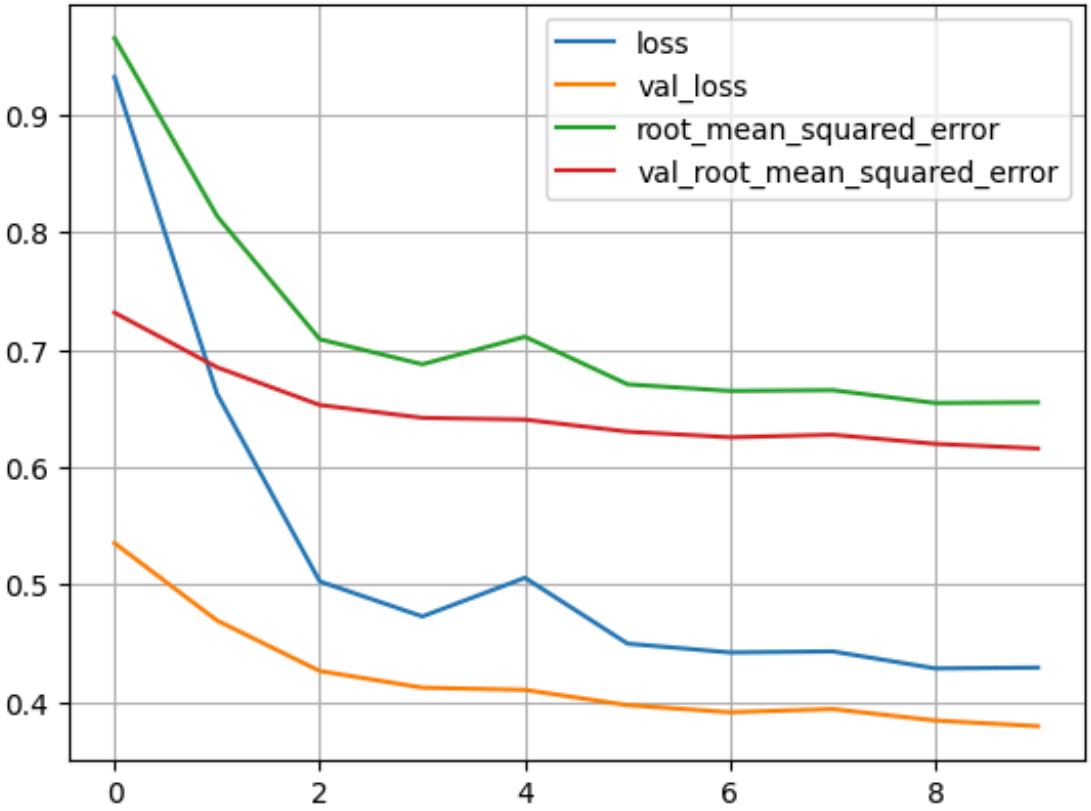
3. Agregar una capa de regularización, como Dropout, a la red neuronal (50%)

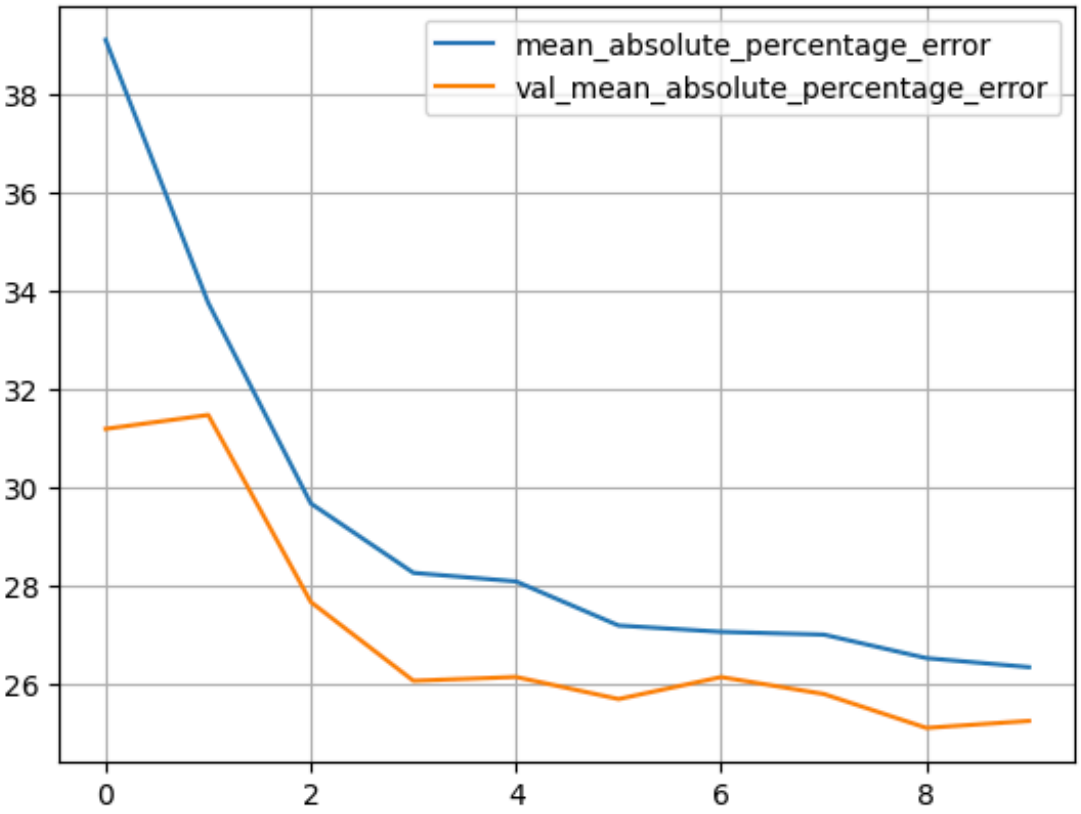




```
363/363 [==============================] - 1s 2ms/step -
loss: 0.4140 - root_mean_squared_error: 0.6434 -
mean_absolute_percentage_error: 29.0330
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.41402167081832886
root_mean_squared_error train: 0.6434451341629028
mean_absolute_percentage_error train: 29.032978057861328
121/121 [==============================] - 0s 2ms/step -
loss: 0.4183 - root_mean_squared_error: 0.6468 -
mean_absolute_percentage_error: 28.8222
Evaluar el modelo en el conjunto de validacion
loss valid: 0.41829484701156616
root_mean_squared_error valid: 0.646757185459137
mean_absolute_percentage_error valid: 28.822200775146484
162/162 [==============================] - 0s 2ms/step -
loss: 0.4222 - root_mean_squared_error: 0.6498 -
mean_absolute_percentage_error: 28.9758
Evaluar el modelo en el conjunto de prueba
loss test: 0.4222431480884552
root_mean_squared_error test: 0.6498023867607117
mean_absolute_percentage_error test: 28.975805282592773
```

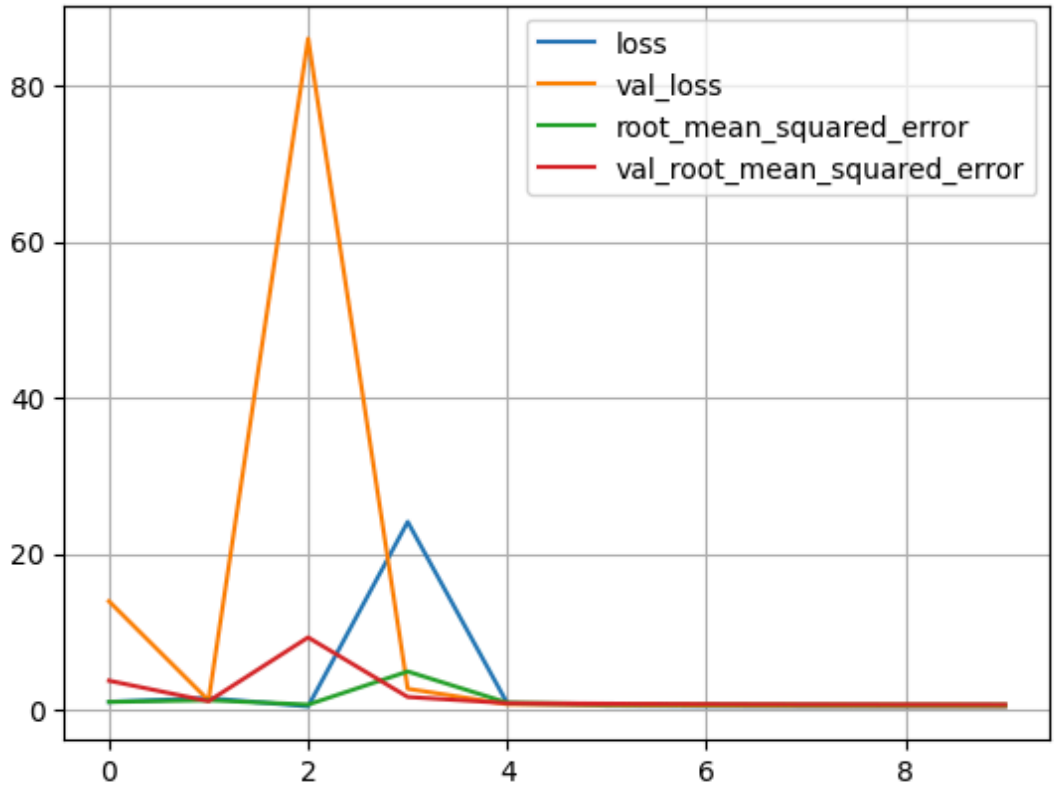
3. Agregar una capa de regularización, como Dropout, a la red neuronal (10%)

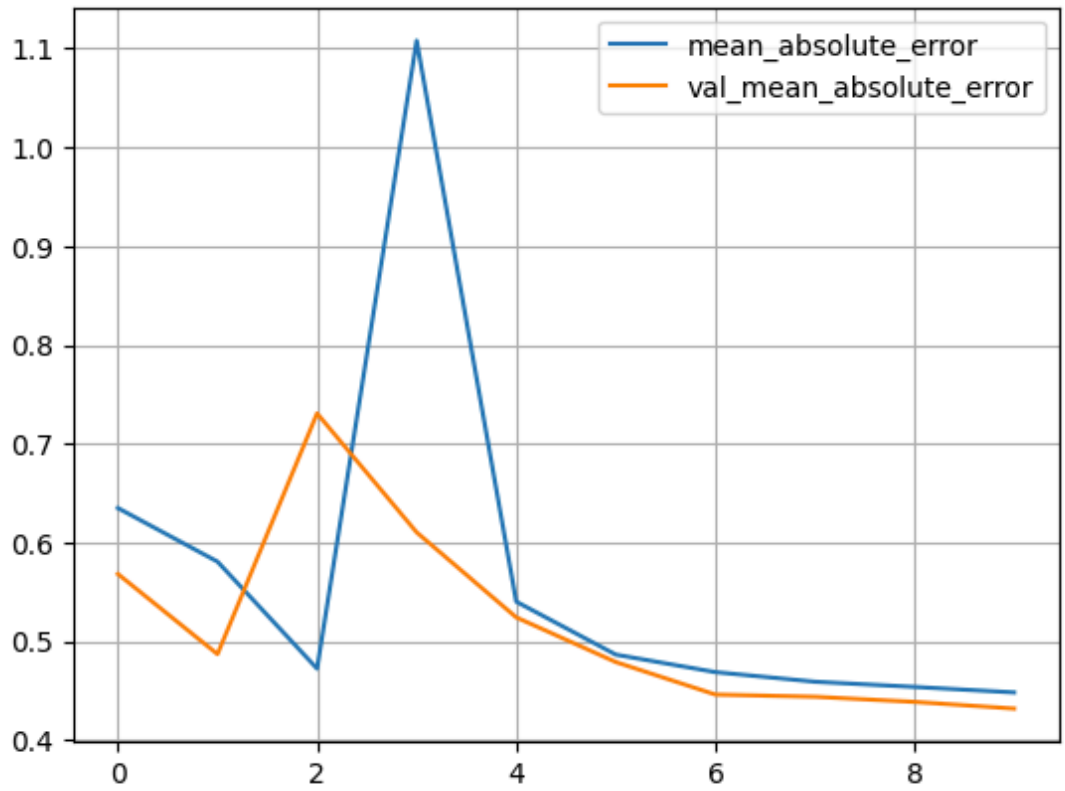




```
363/363 [==============================] - 1s 2ms/step -
loss: 0.3909 - root_mean_squared_error: 0.6252 -
mean_absolute_percentage_error: 25.2864
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.3908570408821106
root_mean_squared_error train: 0.6251856088638306
mean_absolute_percentage_error train: 25.28643226623535
121/121 [==============================] - 0s 2ms/step -
loss: 0.3796 - root_mean_squared_error: 0.6161 -
mean_absolute_percentage_error: 25.2659
Evaluar el modelo en el conjunto de validacion
loss valid: 0.3795810043811798
root_mean_squared_error valid: 0.6161014437675476
mean_absolute_percentage_error valid: 25.265907287597656
162/162 [==============================] - 0s 2ms/step -
loss: 0.3991 - root_mean_squared_error: 0.6317 -
mean_absolute_percentage_error: 24.9721
Evaluar el modelo en el conjunto de prueba
loss test: 0.3990865647792816
root_mean_squared_error test: 0.6317330002784729
mean_absolute_percentage_error test: 24.97214698791504
```

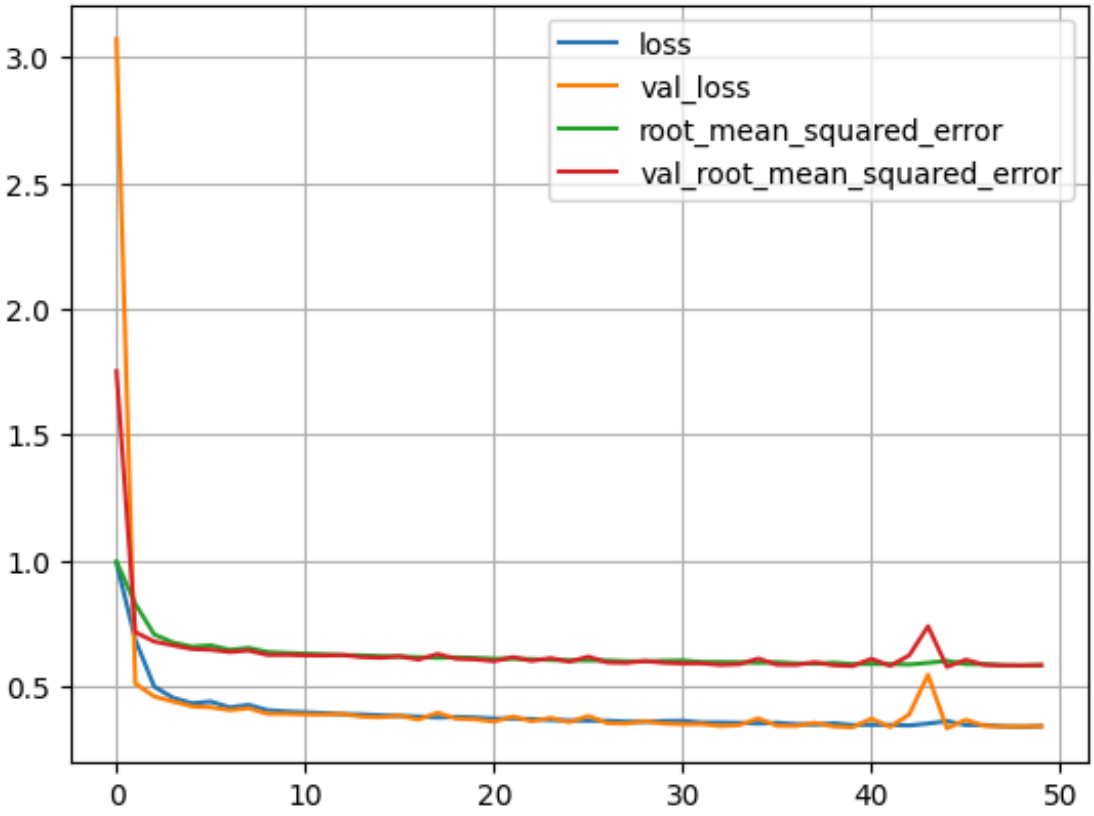
4. Cambiar la función de perdida a “mean_absolute_error”

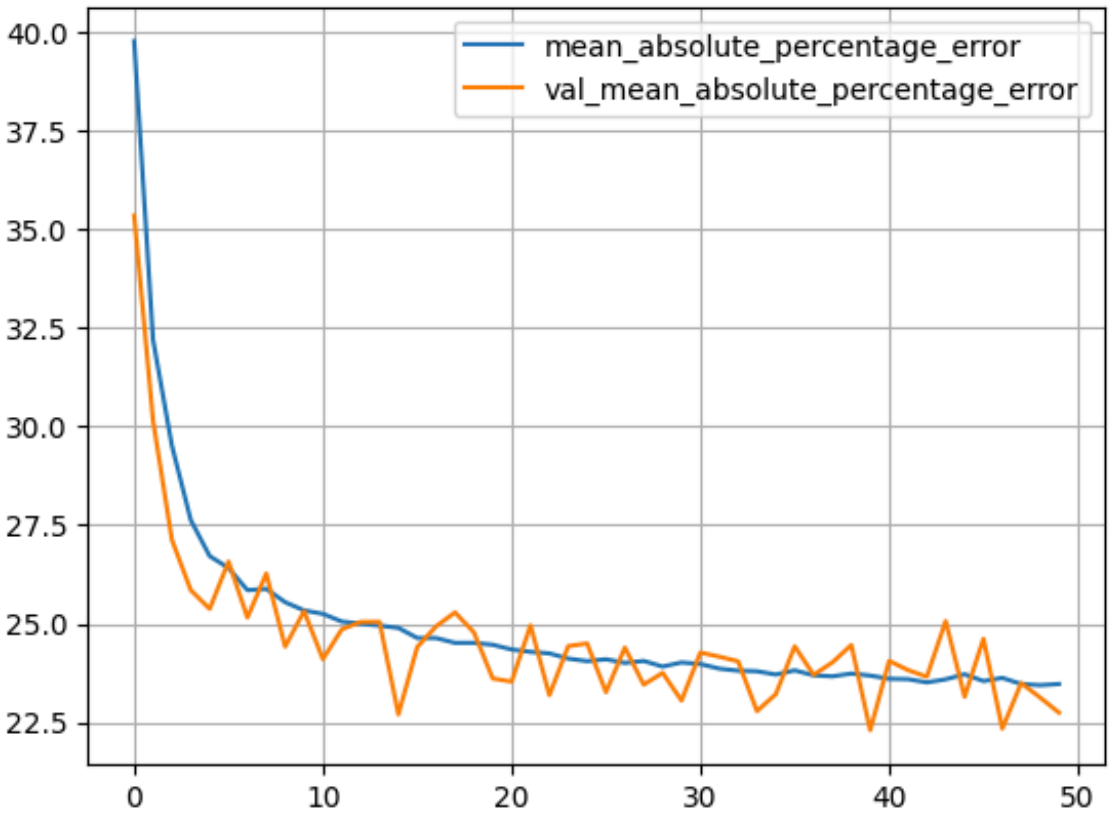




```
363/363 [==============================] - 1s 2ms/step -
loss: 0.3994 - root_mean_squared_error: 0.6320 -
mean_absolute_error: 0.4403
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.3993978202342987
root_mean_squared_error train: 0.6319792866706848
mean_absolute_error train: 0.4403016269207001
121/121 [==============================] - 0s 3ms/step -
loss: 0.4568 - root_mean_squared_error: 0.6758 -
mean_absolute_error: 0.4319
Evaluar el modelo en el conjunto de validacion
loss valid: 0.4567718207836151
root_mean_squared_error valid: 0.6758489608764648
mean_absolute_error valid: 0.4319297969341278
162/162 [==============================] - 1s 3ms/step -
loss: 0.4285 - root_mean_squared_error: 0.6546 -
mean_absolute_error: 0.4436
Evaluar el modelo en el conjunto de prueba
loss test: 0.4284643828868866
root_mean_squared_error test: 0.6545718908309937
mean_absolute_error test: 0.44359272718429565
```

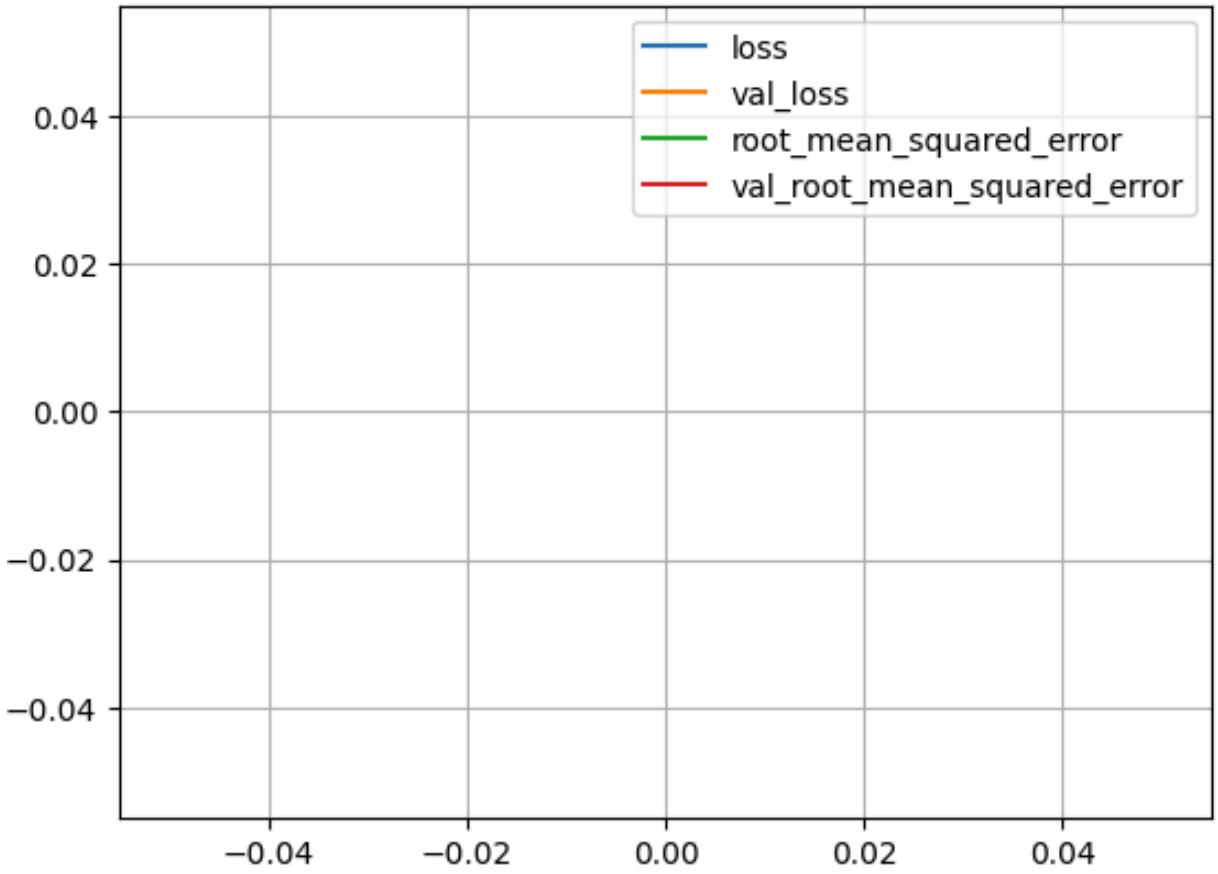
5. Cambiar el número de épocas (50)

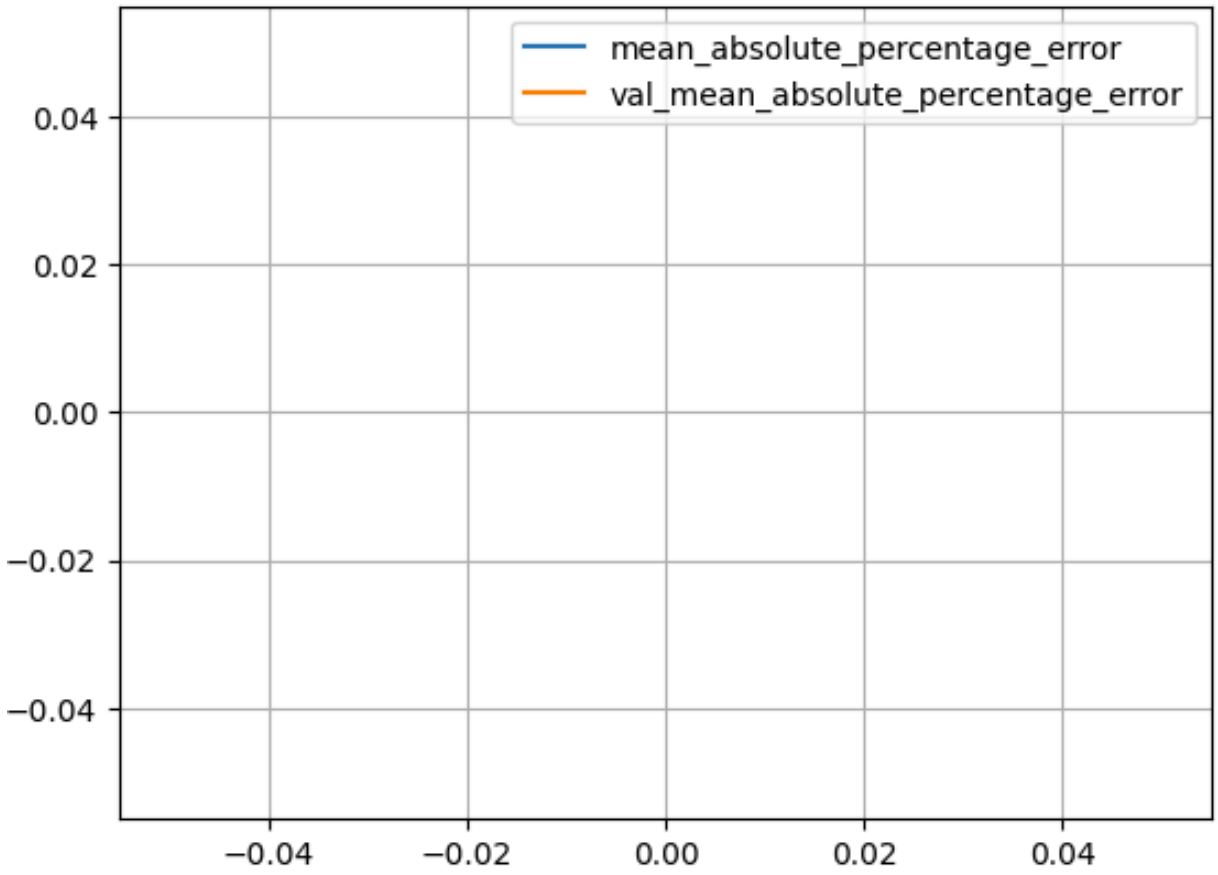




```
363/363 [==============================] - 1s 2ms/step -
loss: 0.3344 - root_mean_squared_error: 0.5783 -
mean_absolute_percentage_error: 22.9365
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.3344368636608124
root_mean_squared_error train: 0.578305184841156
mean_absolute_percentage_error train: 22.936519622802734
121/121 [==============================] - 0s 2ms/step -
loss: 0.3412 - root_mean_squared_error: 0.5841 -
mean_absolute_percentage_error: 22.7464
Evaluar el modelo en el conjunto de validacion
loss valid: 0.3411719501018524
root_mean_squared_error valid: 0.584099292755127
mean_absolute_percentage_error valid: 22.746423721313477
162/162 [==============================] - 0s 3ms/step -
loss: 0.3193 - root_mean_squared_error: 0.5650 -
mean_absolute_percentage_error: 22.6423
Evaluar el modelo en el conjunto de prueba
loss test: 0.3192640542984009
root_mean_squared_error test: 0.5650345683097839
mean_absolute_percentage_error test: 22.64225196838379
```

6. Eliminar estandarización de datos

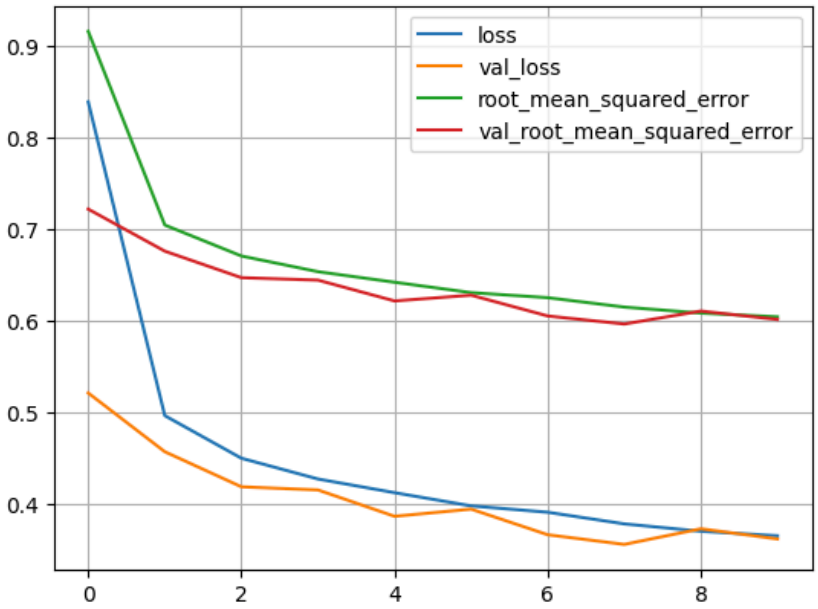


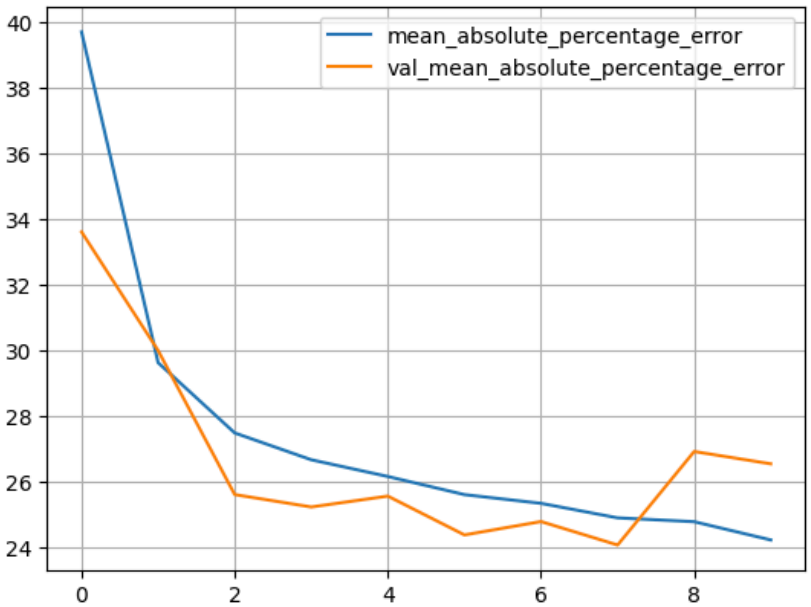


```
363/363 [==============================] - 1s 2ms/step -
loss: nan - root_mean_squared_error: nan -
mean_absolute_percentage_error: nan
Evaluar el modelo en el conjunto de entrenamiento
loss train: nan
root_mean_squared_error train: nan
mean_absolute_percentage_error train: nan
121/121 [==============================] - 0s 2ms/step -
loss: nan - root_mean_squared_error: nan -
mean_absolute_percentage_error: nan
Evaluar el modelo en el conjunto de validacion
loss valid: nan
root_mean_squared_error valid: nan
mean_absolute_percentage_error valid: nan
162/162 [==============================] - 0s 2ms/step -
loss: nan - root_mean_squared_error: nan -
mean_absolute_percentage_error: nan
Evaluar el modelo en el conjunto de prueba
loss test: nan
root_mean_squared_error test: nan
mean_absolute_percentage_error test: nan
```

7. Diferente arquitectura

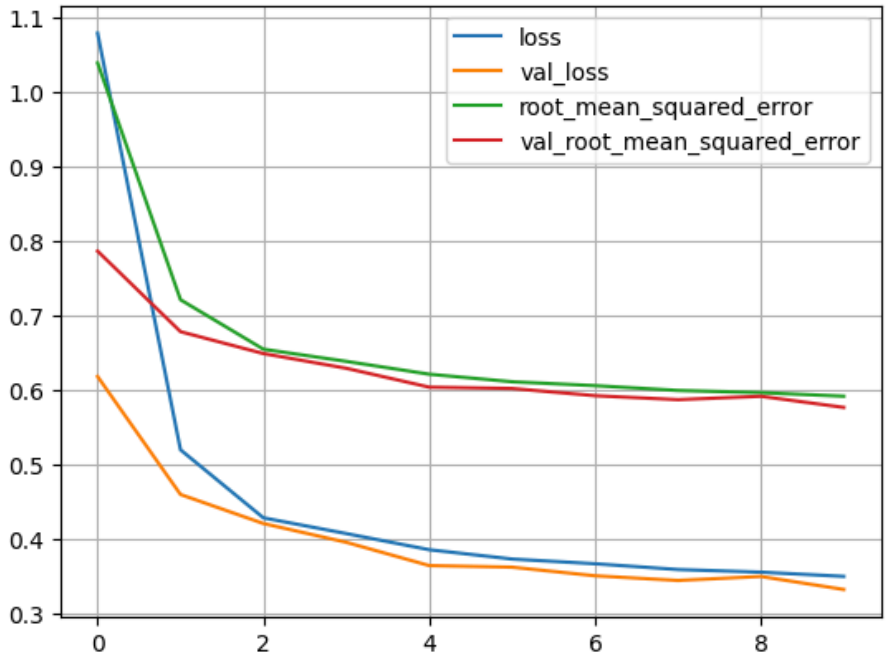
```
model = keras.models.Sequential([
    keras.layers.Dense(30, activation="relu",
input_shape=X_train.shape[1:]),
    keras.layers.Dense(30, activation="relu",
input_shape=X_train.shape[1:]),
    keras.layers.Dense(30, activation="relu",
input_shape=X_train.shape[1:]),
    keras.layers.Dense(30, activation="relu",
input_shape=X_train.shape[1:]),
    keras.layers.Dense(1)])
```

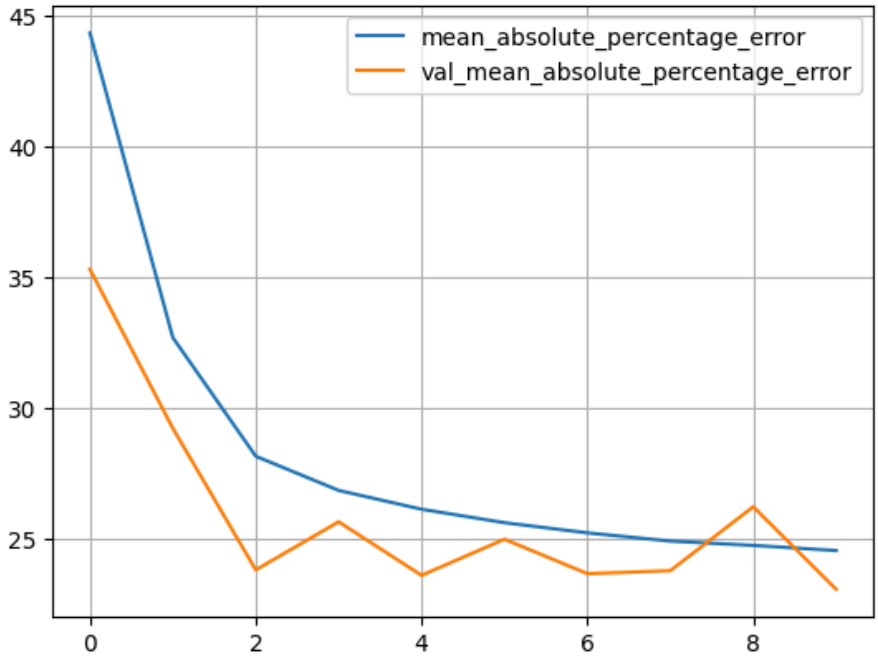




```
363/363 [==============================] - 1s 2ms/step -
loss: 0.3706 - root_mean_squared_error: 0.6088 -
mean_absolute_percentage_error: 26.5396
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.3706313371658325
root_mean_squared_error train: 0.6087949872016907
mean_absolute_percentage_error train: 26.539609909057617
121/121 [==============================] - 0s 3ms/step -
loss: 0.3614 - root_mean_squared_error: 0.6012 -
mean_absolute_percentage_error: 26.5568
Evaluar el modelo en el conjunto de validacion
loss valid: 0.36138665676116943
root_mean_squared_error valid: 0.6011544466018677
mean_absolute_percentage_error valid: 26.556764602661133
162/162 [==============================] - 0s 2ms/step -
loss: 0.3658 - root_mean_squared_error: 0.6048 -
mean_absolute_percentage_error: 27.0208
Evaluar el modelo en el conjunto de prueba
loss test: 0.3658105134963989
root_mean_squared_error test: 0.6048226952552795
mean_absolute_percentage_error test: 27.02077865600586
```

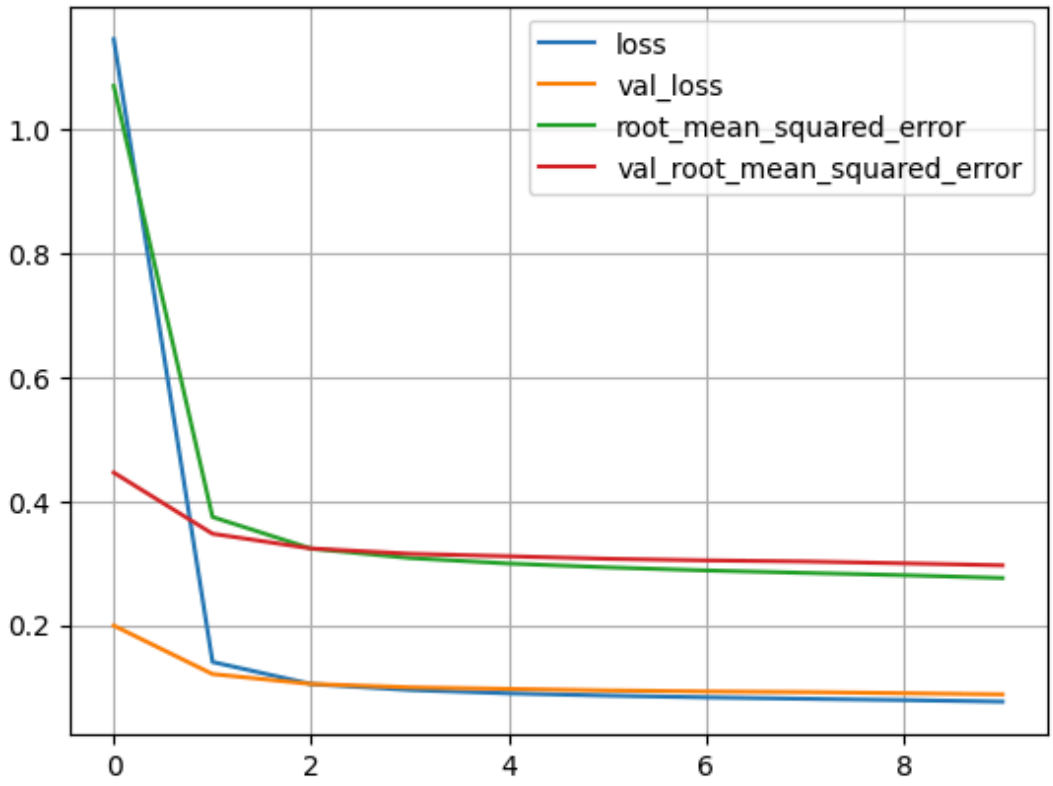
```
model = keras.models.Sequential([
    keras.layers.Dense(10, activation="relu",
input_shape=X_train.shape[1:]),
    keras.layers.Dense(30, activation="relu",
input_shape=X_train.shape[1:]),
    keras.layers.Dense(50, activation="relu",
input_shape=X_train.shape[1:]),
    keras.layers.Dense(10, activation="relu",
input_shape=X_train.shape[1:]),
    keras.layers.Dense(1)])
```

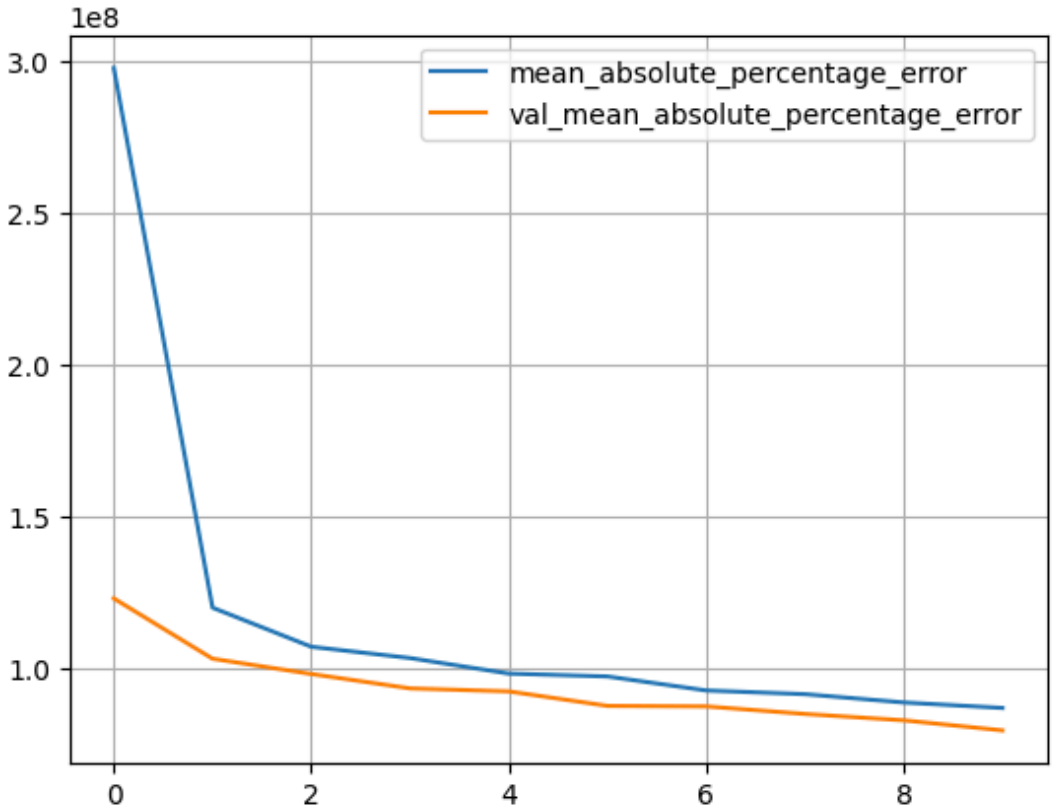




```
363/363 [==============================] - 1s 2ms/step -
loss: 0.3406 - root_mean_squared_error: 0.5836 -
mean_absolute_percentage_error: 24.0740
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.3405866324901581
root_mean_squared_error train: 0.5835980176925659
mean_absolute_percentage_error train: 24.073963165283203
121/121 [==============================] - 0s 2ms/step -
loss: 0.3322 - root_mean_squared_error: 0.5764 -
mean_absolute_percentage_error: 23.1017
Evaluar el modelo en el conjunto de validacion
loss valid: 0.3322317898273468
root_mean_squared_error valid: 0.5763955116271973
mean_absolute_percentage_error valid: 23.101743698120117
162/162 [==============================] - 0s 2ms/step -
loss: 0.3547 - root_mean_squared_error: 0.5955 -
mean_absolute_percentage_error: 23.8663
Evaluar el modelo en el conjunto de prueba
loss test: 0.35465121269226074
root_mean_squared_error test: 0.5955259799957275
mean_absolute_percentage_error test: 23.866342544555664
```

8. Cancer de mama. load_breast_cancer





```
10/10 [==============================] - 0s 2ms/step -
loss: 0.0745 - root_mean_squared_error: 0.2729 -
mean_absolute_percentage_error: 83766192.0000
Evaluar el modelo en el conjunto de entrenamiento
loss train: 0.07446900010108948
root_mean_squared_error train: 0.2728900909423828
mean_absolute_percentage_error train: 83766192.0
4/4 [==============================] - 0s 4ms/step - loss:
0.0877 - root_mean_squared_error: 0.2961 -
mean_absolute_percentage_error: 79820112.0000
Evaluar el modelo en el conjunto de validacion
loss valid: 0.08770354092121124
root_mean_squared_error valid: 0.29614782333374023
mean_absolute_percentage_error valid: 79820112.0
5/5 [==============================] - 0s 4ms/step - loss:
0.0883 - root_mean_squared_error: 0.2971 -
mean_absolute_percentage_error: 74296152.0000
Evaluar el modelo en el conjunto de prueba
loss test: 0.08825545758008957
root_mean_squared_error test: 0.2970781922340393
mean_absolute_percentage_error test: 74296152.0
```