**Experimento 1**

Learning rate warm up 0.001

Learning rate fine tunning 0.000001

3/3 ━━━━━━━━━━━━━━━━━━━━ 13s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.69 0.74 67

Clase 1 0.19 0.29 0.23 17

accuracy 0.61 84

macro avg 0.49 0.49 0.48 84

weighted avg 0.67 0.61 0.63 84

Test set AUC Score after fine-tuning: 0.38279192273924495

17/17 ━━━━━━━━━━━━━━━━━━━━ 12s 703ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.78 0.74 0.76 265

Clase 1 0.19 0.23 0.21 70

accuracy 0.63 335

macro avg 0.49 0.48 0.48 335

weighted avg 0.66 0.63 0.65 335

Train set AUC Score after fine-tuning: 0.48463611859838274

**Experimento 2**

Learning rate warm up 0.0001

Learning rate fine tunning 0.0001

3/3 ━━━━━━━━━━━━━━━━━━━━ 16s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.77 0.81 0.79 67

Clase 1 0.07 0.06 0.06 17

accuracy 0.65 84

macro avg 0.42 0.43 0.43 84

weighted avg 0.63 0.65 0.64 84

Test set AUC Score after fine-tuning: 0.38542581211589116

17/17 ━━━━━━━━━━━━━━━━━━━━ 13s 779ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.78 0.82 0.80 265

Clase 1 0.16 0.13 0.14 70

accuracy 0.67 335

macro avg 0.47 0.47 0.47 335

weighted avg 0.65 0.67 0.66 335

Train set AUC Score after fine-tuning: 0.44204851752021557

**Experimento 3**

Learning rate warm up 0.01

Learning rate fine tunning 0.001

3/3 ━━━━━━━━━━━━━━━━━━━━ 13s 4s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.80 0.70 0.75 67

Clase 1 0.20 0.29 0.24 17

accuracy 0.62 84

macro avg 0.50 0.50 0.49 84

weighted avg 0.68 0.62 0.64 84

Test set AUC Score after fine-tuning: 0.5127304653204565

17/17 ━━━━━━━━━━━━━━━━━━━━ 12s 745ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.78 0.70 0.74 265

Clase 1 0.18 0.26 0.21 70

accuracy 0.61 335

macro avg 0.48 0.48 0.48 335

weighted avg 0.66 0.61 0.63 335

Train set AUC Score after fine-tuning: 0.45358490566037735

**Experimento 4**

Learning rate warm up 0.01

Learning rate fine tunning 0.00001

3/3 ━━━━━━━━━━━━━━━━━━━━ 13s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.81 0.93 0.86 67

Clase 1 0.29 0.12 0.17 17

accuracy 0.76 84

macro avg 0.55 0.52 0.51 84

weighted avg 0.70 0.76 0.72 84

Test set AUC Score after fine-tuning: 0.42230026338893767

17/17 ━━━━━━━━━━━━━━━━━━━━ 12s 726ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.94 0.86 265

Clase 1 0.26 0.09 0.13 70

accuracy 0.76 335

macro avg 0.53 0.51 0.49 335

weighted avg 0.68 0.76 0.71 335

Train set AUC Score after fine-tuning: 0.5182749326145553

**Experimento 5**

Learning rate warm up 0.001

Learning rate fine tunning 0.000001

3/3 ━━━━━━━━━━━━━━━━━━━━ 12s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.82 0.80 67

Clase 1 0.14 0.12 0.13 17

accuracy 0.68 84

macro avg 0.46 0.47 0.47 84

weighted avg 0.66 0.68 0.67 84

Test set AUC Score after fine-tuning: 0.47058823529411764

17/17 ━━━━━━━━━━━━━━━━━━━━ 11s 654ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.91 0.85 265

Clase 1 0.20 0.09 0.12 70

accuracy 0.74 335

macro avg 0.50 0.50 0.48 335

weighted avg 0.67 0.74 0.69 335

Train set AUC Score after fine-tuning: 0.43035040431266847

**Experimento 6**

Learning rate warm up 0.0001

Learning rate fine tunning 0.0000001

3/3 ━━━━━━━━━━━━━━━━━━━━ 12s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.78 0.78 0.78 67

Clase 1 0.12 0.12 0.12 17

accuracy 0.64 84

macro avg 0.45 0.45 0.45 84

weighted avg 0.64 0.64 0.64 84

Test set AUC Score after fine-tuning: 0.3687445127304653

17/17 ━━━━━━━━━━━━━━━━━━━━ 11s 668ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.81 0.67 0.73 265

Clase 1 0.24 0.39 0.29 70

accuracy 0.61 335

macro avg 0.52 0.53 0.51 335

weighted avg 0.69 0.61 0.64 335

Train set AUC Score after fine-tuning: 0.48641509433962266

**Experimento 7**

Learning rate warm up 0.0001

Learning rate fine tunning 0.00000001

3/3 ━━━━━━━━━━━━━━━━━━━━ 20s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.80 0.97 0.88 67

Clase 1 0.33 0.06 0.10 17

accuracy 0.79 84

macro avg 0.57 0.51 0.49 84

weighted avg 0.71 0.79 0.72 84

Test set AUC Score after fine-tuning: 0.5048287971905181

17/17 ━━━━━━━━━━━━━━━━━━━━ 12s 702ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.95 0.86 265

Clase 1 0.24 0.06 0.09 70

accuracy 0.76 335

macro avg 0.51 0.50 0.48 335

weighted avg 0.68 0.76 0.70 335

Train set AUC Score after fine-tuning: 0.48010781671159025

**Experimento 8**

Learning rate warm up 0.0001

Learning rate fine tunning 0.00000001

3/3 ━━━━━━━━━━━━━━━━━━━━ 15s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.94 0.86 67

Clase 1 0.00 0.00 0.00 17

accuracy 0.75 84

macro avg 0.39 0.47 0.43 84

weighted avg 0.63 0.75 0.68 84

Test set AUC Score after fine-tuning: 0.4811237928007024

17/17 ━━━━━━━━━━━━━━━━━━━━ 13s 772ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.97 0.87 265

Clase 1 0.00 0.00 0.00 70

accuracy 0.76 335

macro avg 0.39 0.48 0.43 335

weighted avg 0.62 0.76 0.69 335

Train set AUC Score after fine-tuning: 0.5402695417789758

**Experimento 9**

Learning rate warm up 0.00001

Learning rate fine tunning 0.0001

3/3 ━━━━━━━━━━━━━━━━━━━━ 14s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.77 0.70 0.73 67

Clase 1 0.13 0.18 0.15 17

accuracy 0.60 84

macro avg 0.45 0.44 0.44 84

weighted avg 0.64 0.60 0.62 84

Test set AUC Score after fine-tuning: 0.469710272168569

17/17 ━━━━━━━━━━━━━━━━━━━━ 12s 727ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.78 0.78 265

Clase 1 0.19 0.20 0.20 70

accuracy 0.66 335

macro avg 0.49 0.49 0.49 335

weighted avg 0.66 0.66 0.66 335

Train set AUC Score after fine-tuning: 0.4822102425876011

**Experimento 10**

Learning rate warm up 0.001

Learning rate fine tunning 0.000001

3/3 ━━━━━━━━━━━━━━━━━━━━ 13s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.82 0.84 0.83 67

Clase 1 0.31 0.29 0.30 17

accuracy 0.73 84

macro avg 0.57 0.56 0.57 84

weighted avg 0.72 0.73 0.72 84

Test set AUC Score after fine-tuning: 0.5750658472344162

17/17 ━━━━━━━━━━━━━━━━━━━━ 12s 743ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.78 0.87 0.82 265

Clase 1 0.17 0.10 0.12 70

accuracy 0.71 335

macro avg 0.48 0.48 0.47 335

weighted avg 0.66 0.71 0.68 335

Train set AUC Score after fine-tuning: 0.5019946091644205

**DATA AUGMENTATION EXPERIMENTS**

**Experimento 1**

Learning rate warm up 0.001

Learning rate fine tunning 0.000001

train\_datagen = ImageDataGenerator(

preprocessing\_function=preprocess\_input,

rotation\_range=10,

width\_shift\_range=0.2,

height\_shift\_range=0.2,

horizontal\_flip=True,

vertical\_flip=True,

shear\_range=0.2,

zoom\_range=0.2,

validation\_split=0.2

)

3/3 ━━━━━━━━━━━━━━━━━━━━ 13s 4s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.80 0.76 0.78 67

Clase 1 0.20 0.24 0.22 17

accuracy 0.65 84

macro avg 0.50 0.50 0.50 84

weighted avg 0.68 0.65 0.66 84

Test set AUC Score after fine-tuning: 0.5355575065847235

17/17 ━━━━━━━━━━━━━━━━━━━━ 12s 704ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.85 0.82 265

Clase 1 0.20 0.14 0.17 70

accuracy 0.70 335

macro avg 0.49 0.50 0.49 335

weighted avg 0.67 0.70 0.68 335

Train set AUC Score after fine-tuning: 0.5064690026954177

**Experimento 2**

Learning rate warm up 0.001

Learning rate fine tunning 0.000001

train\_datagen = ImageDataGenerator(

preprocessing\_function=preprocess\_input,

rotation\_range=10,

brightness\_range=[0.8, 1.2],

validation\_split=0.2

)

3/3 ━━━━━━━━━━━━━━━━━━━━ 14s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.81 0.81 0.81 67

Clase 1 0.24 0.24 0.24 17

accuracy 0.69 84

macro avg 0.52 0.52 0.52 84

weighted avg 0.69 0.69 0.69 84

Test set AUC Score after fine-tuning: 0.5329236172080773

17/17 ━━━━━━━━━━━━━━━━━━━━ 13s 765ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.78 0.86 0.82 265

Clase 1 0.16 0.10 0.12 70

accuracy 0.70 335

macro avg 0.47 0.48 0.47 335

weighted avg 0.65 0.70 0.67 335

Train set AUC Score after fine-tuning: 0.47455525606469007

**Experimento 3**

Learning rate warm up 0.001

Learning rate fine tunning 0.000001

train\_datagen = ImageDataGenerator(

preprocessing\_function=preprocess\_input,

width\_shift\_range=0.1,

height\_shift\_range=0.1,

validation\_split=0.2

)

3/3 ━━━━━━━━━━━━━━━━━━━━ 12s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.81 0.76 0.78 67

Clase 1 0.24 0.29 0.26 17

accuracy 0.67 84

macro avg 0.52 0.53 0.52 84

weighted avg 0.69 0.67 0.68 84

Test set AUC Score after fine-tuning: 0.46971027216856887

17/17 ━━━━━━━━━━━━━━━━━━━━ 12s 739ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.82 0.80 265

Clase 1 0.20 0.17 0.18 70

accuracy 0.68 335

macro avg 0.49 0.50 0.49 335

weighted avg 0.67 0.68 0.67 335

Train set AUC Score after fine-tuning: 0.5056603773584906

**Experimento 4**

Learning rate warm up 0.001

Learning rate fine tunning 0.000001

train\_datagen = ImageDataGenerator(

preprocessing\_function=preprocess\_input,

rotation\_range=10,

brightness\_range=[0.8, 1.2],

validation\_split=0.2

)

3/3 ━━━━━━━━━━━━━━━━━━━━ 13s 3s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.81 0.82 0.81 67

Clase 1 0.25 0.24 0.24 17

accuracy 0.70 84

macro avg 0.53 0.53 0.53 84

weighted avg 0.70 0.70 0.70 84

Test set AUC Score after fine-tuning: 0.4820017559262511

17/17 ━━━━━━━━━━━━━━━━━━━━ 13s 755ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.82 0.80 265

Clase 1 0.21 0.19 0.20 70

accuracy 0.68 335

macro avg 0.50 0.50 0.50 335

weighted avg 0.67 0.68 0.68 335

Train set AUC Score after fine-tuning: 0.5212938005390836

**Experimento 5**

Learning rate warm up 0.001

Learning rate fine tunning 0.000001

train\_datagen = ImageDataGenerator(

preprocessing\_function=preprocess\_input,

horizontal\_flip=True,

channel\_shift\_range=10.0,

validation\_split=0.2

)

3/3 ━━━━━━━━━━━━━━━━━━━━ 14s 4s/step

Test set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.79 0.72 0.75 67

Clase 1 0.17 0.24 0.20 17

accuracy 0.62 84

macro avg 0.48 0.48 0.47 84

weighted avg 0.66 0.62 0.64 84

Test set AUC Score after fine-tuning: 0.37050043898156276

17/17 ━━━━━━━━━━━━━━━━━━━━ 7s 430ms/step

Train set classification report after fine-tuning:

precision recall f1-score support

Clase 0 0.80 0.81 0.80 265

Clase 1 0.23 0.21 0.22 70

accuracy 0.69 335

macro avg 0.51 0.51 0.51 335

weighted avg 0.68 0.69 0.68 335

Train set AUC Score after fine-tuning: 0.502587601078167