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import pandas as pd
import numpy as np
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras import layers, models
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler

df=pd.read_csv("/content/drive/MyDrive/Colab Notebooks/diabetes1.csv")

x=df.iloc[:,0:8]
y=df["Outcome"]

obj=StandardScaler()

x_=obj.fit_transform(x)

Xtrain,Xtest,Ytrain,Ytest=train_test_split(x_,y,test_size=0.3, random_state = 1)

model=models.Sequential()
model.add(layers.Dense(128,activation="relu"))
model.add(layers.Dense(64,activation="relu"))
model.add(layers.Dense(32,activation="relu"))
model.add(layers.Dense(16,activation="relu"))
model.add(layers.Dense(6,activation="relu"))
model.add(layers.Dense(1,activation="sigmoid"))

model.compile(optimizer="adam",loss="binary_crossentropy", metrics=["accuracy",tf.keras.metrics.AUC(from_logits=True),tf.keras.metrics.Pr

h = model.fit(Xtrain,Ytrain, epochs=40, validation_data = (Xtest, Ytest))

Epoch 1/40
17/17 [=====] - 0s 23ms/step - loss: 0.6312 - accuracy: 0.7914 - auc: 0.7947 - precision: 0.3408 - recall: 0.3408
Epoch 2/40
17/17 [=====] - 0s 9ms/step - loss: 0.6210 - accuracy: 0.7840 - auc: 0.7992 - precision: 0.3408 - recall: 0.3408
Epoch 3/40
17/17 [=====] - 0s 9ms/step - loss: 0.6140 - accuracy: 0.8156 - auc: 0.7867 - precision: 0.3408 - recall: 0.3408
Epoch 4/40
17/17 [=====] - 0s 11ms/step - loss: 0.6054 - accuracy: 0.7933 - auc: 0.7879 - precision: 0.3408 - recall: 0.3408
Epoch 5/40
17/17 [=====] - 0s 9ms/step - loss: 0.6023 - accuracy: 0.7914 - auc: 0.8035 - precision: 0.3408 - recall: 0.3408
Epoch 6/40
17/17 [=====] - 0s 11ms/step - loss: 0.5946 - accuracy: 0.8045 - auc: 0.7953 - precision: 0.3408 - recall: 0.3408
Epoch 7/40
17/17 [=====] - 0s 9ms/step - loss: 0.5807 - accuracy: 0.8250 - auc: 0.8186 - precision: 0.3408 - recall: 0.3408
Epoch 8/40
17/17 [=====] - 0s 11ms/step - loss: 0.5713 - accuracy: 0.8231 - auc: 0.8215 - precision: 0.3408 - recall: 0.3408
Epoch 9/40
17/17 [=====] - 0s 10ms/step - loss: 0.5661 - accuracy: 0.8287 - auc: 0.8194 - precision: 0.3408 - recall: 0.3408
Epoch 10/40
17/17 [=====] - 0s 11ms/step - loss: 0.5540 - accuracy: 0.8361 - auc: 0.8244 - precision: 0.3408 - recall: 0.3408
Epoch 11/40
17/17 [=====] - 0s 9ms/step - loss: 0.5449 - accuracy: 0.8436 - auc: 0.8432 - precision: 0.3408 - recall: 0.3408
Epoch 12/40
17/17 [=====] - 0s 9ms/step - loss: 0.5364 - accuracy: 0.8417 - auc: 0.8277 - precision: 0.3408 - recall: 0.3408
Epoch 13/40
17/17 [=====] - 0s 9ms/step - loss: 0.5325 - accuracy: 0.8399 - auc: 0.8279 - precision: 0.3408 - recall: 0.3408
Epoch 14/40
17/17 [=====] - 0s 9ms/step - loss: 0.5268 - accuracy: 0.8454 - auc: 0.8317 - precision: 0.3408 - recall: 0.3408
Epoch 15/40
17/17 [=====] - 0s 12ms/step - loss: 0.5191 - accuracy: 0.8529 - auc: 0.8378 - precision: 0.3408 - recall: 0.3408
Epoch 16/40
17/17 [=====] - 0s 8ms/step - loss: 0.5111 - accuracy: 0.8529 - auc: 0.8356 - precision: 0.3408 - recall: 0.3408
Epoch 17/40
17/17 [=====] - 0s 11ms/step - loss: 0.5007 - accuracy: 0.8641 - auc: 0.8377 - precision: 0.3408 - recall: 0.3408
Epoch 18/40
17/17 [=====] - 0s 9ms/step - loss: 0.4911 - accuracy: 0.8734 - auc: 0.8475 - precision: 0.3408 - recall: 0.3408
Epoch 19/40
17/17 [=====] - 0s 9ms/step - loss: 0.4831 - accuracy: 0.8734 - auc: 0.8511 - precision: 0.3408 - recall: 0.3408
Epoch 20/40
17/17 [=====] - 0s 8ms/step - loss: 0.4831 - accuracy: 0.8771 - auc: 0.8516 - precision: 0.3408 - recall: 0.3408
Epoch 21/40
17/17 [=====] - 0s 13ms/step - loss: 0.4708 - accuracy: 0.8734 - auc: 0.8519 - precision: 0.3408 - recall: 0.3408
Epoch 22/40
17/17 [=====] - 0s 9ms/step - loss: 0.4678 - accuracy: 0.8790 - auc: 0.8396 - precision: 0.3408 - recall: 0.3408
Epoch 23/40
17/17 [=====] - 0s 9ms/step - loss: 0.4597 - accuracy: 0.8827 - auc: 0.8610 - precision: 0.3408 - recall: 0.3408
Epoch 24/40
17/17 [=====] - 0s 9ms/step - loss: 0.4568 - accuracy: 0.8845 - auc: 0.8623 - precision: 0.3408 - recall: 0.3408
Epoch 25/40

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17/17 [=====] - 0s 10ms/step - loss: 0.4609 - accuracy: 0.8808 - auc: 0.8553 - precision: 0.3408 - recall: 0.5
Epoch 26/40
17/17 [=====] - 0s 10ms/step - loss: 0.4456 - accuracy: 0.8845 - auc: 0.8645 - precision: 0.3408 - recall: 0.5
Epoch 27/40
17/17 [=====] - 0s 9ms/step - loss: 0.4357 - accuracy: 0.8957 - auc: 0.8656 - precision: 0.3408 - recall: 0.5
Epoch 28/40
17/17 [=====] - 0s 8ms/step - loss: 0.4235 - accuracy: 0.9069 - auc: 0.8795 - precision: 0.3408 - recall: 0.5
Epoch 29/40

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result = model.evaluate(Xtest,Ytest)
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8/8 [=====] - 0s 5ms/step - loss: 0.6467 - accuracy: 0.7619 - auc: 0.7430 - precision: 0.3680 - recall: 0.5

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```

import matplotlib.pyplot as plt
plt.plot(h.history['loss'],label='loss')
plt.xlabel('Epoch')
plt.ylabel('loss')
# plt.ylim([0, 0.7])
plt.legend(loc='lower right')

```

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<matplotlib.legend.Legend at 0x7c6aaffb6e60>
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