0917451 AI and Machine Learning (Spring 2022)

Quiz 2B

الاسم: رقم التسجيل:

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Instructions: Time **10** minutes. Open book and notes exam. No electronics. Please answer all problems in the space provided and limit your answer to the space provided. No questions are allowed.

P1. The following Python code, that was explained in the class, clusters the moons dataset using the DBSCAN algorithm and uses the KNN classifier for predicting the cluster class. Complete the code below to use a Keras sequential model classifier instead of using the KNN classifier. The model should have two 100-cell dense hidden layers and should be trained for 10 epochs.

[5 marks]

```
import numpy as np
from sklearn.cluster import DBSCAN
from sklearn.datasets import make_moons
from sklearn.neighbors import KNeighborsClassifier

X, y = make_moons(n_samples=1000, noise=0.05)
dbscan = DBSCAN(eps=0.2, min_samples=5)
dbscan.fit(X)

knn = KNeighborsClassifier()
X = dbscan.components_
y = dbscan.labels_[dbscan.core_sample_indices_]
knn.fit(X, y)

X_new = np.array([[-0.5, 0], [0, 0.5], [1, -0.1], [2, 1]])
y_pred = knn.predict(X_new)
print(y_pred)
```

```
from tensorflow import keras

model = keras.models.Sequential()

model.add(keras.layers.Dense(100, activation="relu"))
model.add(keras.layers.Dense(100, activation="relu"))
model.add(keras.layers.Dense(1, activation="sigmoid"))

model.compile(loss="binary_crossentropy", optimizer="sgd",
              metrics=["accuracy"])
history = model.fit(X, y, epochs=10)




y_pred2 = model.predict(X_new)
print(y_pred2)
```

<Good Luck>