**Exp 2**

import tensorflow

from tensorflow import keras

from tensorflow.keras import Sequential

from tensorflow.keras.layers import Dense,Flatten

(X\_train,y\_train),(X\_test,y\_test) = keras.datasets.mnist.load\_data()

X\_test.shape

y\_train

import matplotlib.pyplot as plt

plt.imshow(X\_train[5])

X\_train = X\_train/255

X\_test = X\_test/255

X\_train[0]

model = Sequential()

model.add(Flatten(input\_shape=(28,28)))

model.add(Dense(128,activation='relu'))

model.add(Dense(32,activation='relu'))

model.add(Dense(10,activation='softmax'))

model.summary()

model.compile(loss='sparse\_categorical\_crossentropy',optimizer='Adam',metrics=['accuracy'])

history = model.fit(X\_train,y\_train,epochs=25,validation\_split=0.2)

y\_prob = model.predict(X\_test)

y\_pred = y\_prob.argmax(axis=1)

from sklearn.metrics import accuracy\_score

accuracy\_score(y\_test,y\_pred)

plt.plot(history.history['loss'])

plt.plot(history.history['val\_loss'])

plt.plot(history.history['accuracy'])

plt.plot(history.history['val\_accuracy'])

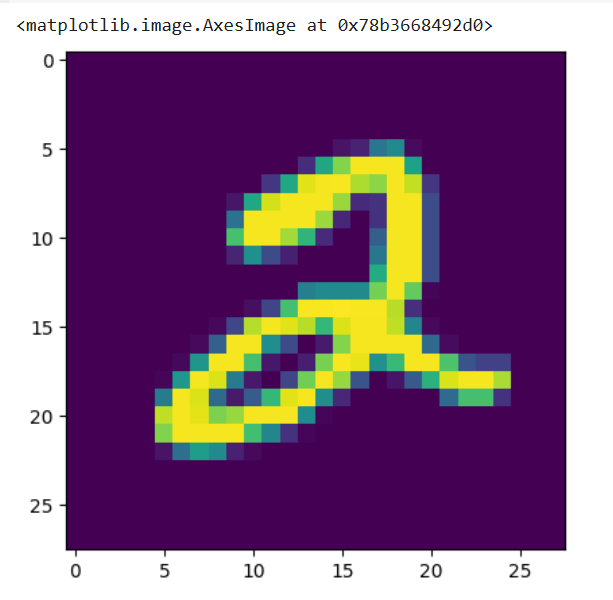
plt.imshow(X\_test[50])

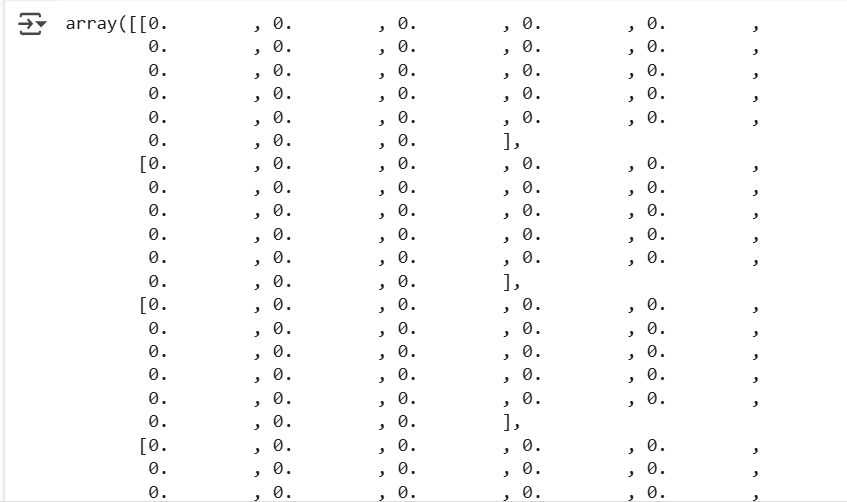
model.predict(X\_test[50].reshape(1,28,28)).argmax(axis=1)

Output

Downloading data from <https://storage.googleapis.com/tensorflow/tf-keras-datasets/mnist.npz>

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/usr/local/lib/python3.11/dist-packages/keras/src/layers/reshaping/flatten.py:37: UserWarning: Do not pass an `input\_shape`/`input\_dim` argument to a layer. When using Sequential models, prefer using an `Input(shape)` object as the first layer in the model instead.

super().\_\_init\_\_(\*\*kwargs)

