```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder, StandardScaler


data = pd.read_csv('/drug200.csv')

for column in data.columns:
    if data[column].nunique() < 6:
        print(column, data[column].unique())
data['Sex'] = data['Sex'].replace({'F': 1, 'M': 0})
data['BP'] = data['BP'].replace({'LOW': 0, 'NORMAL': 1, 'HIGH': 2})
data['Cholesterol'] = data['Cholesterol'].replace({'HIGH': 1,
'NORMAL': 0})
data['Drug'] = data['Drug'].replace({'drugA': 0, 'drugB': 1,  'drugC':
2,  'drugX': 3,  'DrugY': 4 })

features = data.drop('Drug', axis=1)
labels = data['Drug']

le = LabelEncoder()
features['Sex'] = le.fit_transform(features['Sex'])

features = pd.get_dummies(features)

scaler = StandardScaler()
scaled_features = scaler.fit_transform(features)

X_train, X_test, y_train, y_test = train_test_split(scaled_features,
labels, test_size=0.2, random_state=42)

Sex ['F' 'M']
BP ['HIGH' 'LOW' 'NORMAL']
Cholesterol ['HIGH' 'NORMAL']
Drug ['DrugY' 'drugC' 'drugX' 'drugA' 'drugB']

import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense


model = Sequential()
model.add(Dense(128, activation='relu',
input_shape=(X_train.shape[1],)))
model.add(Dense(64, activation='relu'))
model.add(Dense(32, activation='relu'))
model.add(Dense(len(labels.unique()), activation='softmax'))

model.compile(optimizer='adam',
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loss='sparse_categorical_crossentropy', metrics=['accuracy'])


model.fit(X_train, y_train, epochs=50, batch_size=32)
```

```
Epoch 1/50
5/5 [==============================] - 1s 5ms/step - loss: 1.4920 -
accuracy: 0.4875
Epoch 2/50
5/5 [==============================] - 0s 3ms/step - loss: 1.3266 -
accuracy: 0.6438
Epoch 3/50
5/5 [==============================] - 0s 4ms/step - loss: 1.1739 -
accuracy: 0.6375
Epoch 4/50
5/5 [==============================] - 0s 4ms/step - loss: 1.0432 -
accuracy: 0.6562
Epoch 5/50
5/5 [==============================] - 0s 4ms/step - loss: 0.9288 -
accuracy: 0.6687
Epoch 6/50
5/5 [==============================] - 0s 4ms/step - loss: 0.8265 -
accuracy: 0.7437
Epoch 7/50
5/5 [==============================] - 0s 6ms/step - loss: 0.7324 -
accuracy: 0.7875
Epoch 8/50
5/5 [==============================] - 0s 4ms/step - loss: 0.6495 -
accuracy: 0.8188
Epoch 9/50
5/5 [==============================] - 0s 4ms/step - loss: 0.5658 -
accuracy: 0.8500
Epoch 10/50
5/5 [==============================] - 0s 3ms/step - loss: 0.4931 -
accuracy: 0.9000
Epoch 11/50
5/5 [==============================] - 0s 4ms/step - loss: 0.4277 -
accuracy: 0.9125
Epoch 12/50
5/5 [==============================] - 0s 3ms/step - loss: 0.3720 -
accuracy: 0.9500
Epoch 13/50
5/5 [==============================] - 0s 4ms/step - loss: 0.3203 -
accuracy: 0.9625
Epoch 14/50
5/5 [==============================] - 0s 4ms/step - loss: 0.2788 -
accuracy: 0.9625
Epoch 15/50
5/5 [==============================] - 0s 4ms/step - loss: 0.2434 -
accuracy: 0.9812
```

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Epoch 16/50
5/5 [==============================] - 0s 4ms/step - loss: 0.2139 -
accuracy: 0.9875
Epoch 17/50
5/5 [==============================] - 0s 4ms/step - loss: 0.1873 -
accuracy: 0.9937
Epoch 18/50
5/5 [==============================] - 0s 3ms/step - loss: 0.1656 -
accuracy: 0.9812
Epoch 19/50
5/5 [==============================] - 0s 4ms/step - loss: 0.1495 -
accuracy: 0.9812
Epoch 20/50
5/5 [==============================] - 0s 4ms/step - loss: 0.1331 -
accuracy: 0.9875
Epoch 21/50
5/5 [==============================] - 0s 3ms/step - loss: 0.1198 -
accuracy: 0.9937
Epoch 22/50
5/5 [==============================] - 0s 3ms/step - loss: 0.1093 -
accuracy: 0.9937
Epoch 23/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0983 -
accuracy: 0.9937
Epoch 24/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0900 -
accuracy: 0.9937
Epoch 25/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0833 -
accuracy: 0.9937
Epoch 26/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0758 -
accuracy: 0.9937
Epoch 27/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0700 -
accuracy: 0.9937
Epoch 28/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0642 -
accuracy: 0.9937
Epoch 29/50
5/5 [==============================] - 0s 5ms/step - loss: 0.0607 -
accuracy: 0.9937
Epoch 30/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0556 -
accuracy: 0.9937
Epoch 31/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0515 -
accuracy: 1.0000
Epoch 32/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0488 -
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accuracy: 1.0000
Epoch 33/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0459 -
accuracy: 1.0000
Epoch 34/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0427 -
accuracy: 1.0000
Epoch 35/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0403 -
accuracy: 1.0000
Epoch 36/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0382 -
accuracy: 1.0000
Epoch 37/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0359 -
accuracy: 1.0000
Epoch 38/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0342 -
accuracy: 1.0000
Epoch 39/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0320 -
accuracy: 1.0000
Epoch 40/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0303 -
accuracy: 1.0000
Epoch 41/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0289 -
accuracy: 1.0000
Epoch 42/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0276 -
accuracy: 1.0000
Epoch 43/50
5/5 [==============================] - 0s 4ms/step - loss: 0.0256 -
accuracy: 1.0000
Epoch 44/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0247 -
accuracy: 1.0000
Epoch 45/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0236 -
accuracy: 1.0000
Epoch 46/50
5/5 [==============================] - 0s 5ms/step - loss: 0.0224 -
accuracy: 1.0000
Epoch 47/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0220 -
accuracy: 1.0000
Epoch 48/50
5/5 [==============================] - 0s 5ms/step - loss: 0.0204 -
accuracy: 1.0000
Epoch 49/50
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5/5 [==============================] - 0s 4ms/step - loss: 0.0195 -
accuracy: 1.0000
Epoch 50/50
5/5 [==============================] - 0s 3ms/step - loss: 0.0189 -
accuracy: 1.0000

<keras.callbacks.History at 0x7f49a2b4b3a0>
```

```python
import numpy as np


random_data = np.random.rand(5, X_train.shape[1])

predictions = model.predict(random_data)

predicted_classes = np.argmax(predictions, axis=1)

#predicted_drugs = le.inverse_transform(predicted_classes)

print("Predicted Drug Classes:")
for drug in predicted_classes:
    print(drug)
```

```
1/1 [==============================] - 0s 22ms/step
Predicted Drug Classes:
4
4
4
4
4
```