```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

%matplotlib inline

import tensorflow as tf
from tensorflow import keras
from tensorflow.keras import Sequential
from tensorflow.keras.layers import Dense, Flatten
```

```
df=pd.read_csv("/content/Admission_Predict_Ver1.1.csv")
df.head()
```

	Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
0	1	337	118	4	4.5	4.5	9.65	1	0.92
1	2	324	107	4	4.0	4.5	8.87	1	0.76
2	3	316	104	3	3.0	3.5	8.00	1	0.72
3	4	322	110	3	3.5	2.5	8.67	1	0.80
4	5	314	103	2	2.0	3.0	8.21	0	0.65

```
df.shape
```

```
(500, 9)
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 500 entries, 0 to 499
Data columns (total 9 columns):
 #   Column             Non-Null Count  Dtype  
---  ------             --------------  -----  
 0   Serial No.         500 non-null    int64  
 1   GRE Score          500 non-null    int64  
 2   TOEFL Score        500 non-null    int64  
 3   University Rating  500 non-null    int64  
 4   SOP                500 non-null    float64
 5   LOR                500 non-null    float64
 6   CGPA               500 non-null    float64
 7   Research           500 non-null    int64  
 8   Chance of Admit    500 non-null    float64
dtypes: float64(4), int64(5)
memory usage: 35.3 KB
```

```
df.describe()
```

	Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	C
count	500.000000	500.000000	500.000000	500.000000	500.000000	500.00000	500.000
mean	250.500000	316.472000	107.192000	3.114000	3.374000	3.48400	8.576
std	144.481833	11.295148	6.081868	1.143512	0.991004	0.92545	0.604
min	1.000000	290.000000	92.000000	1.000000	1.000000	1.00000	6.800
75%	375.250000	325.000000	112.000000	4.000000	4.000000	4.00000	9.040

```
df.isnull().sum().sum()
```

```
0
```

```
df.drop('Serial No.', axis =1 , inplace = True)
```

```
df.head(2)
```

	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
0	337	118	4	4.5	4.5	9.65	1	0.92
1	324	107	4	4.0	4.5	8.87	1	0.76

```
x = df.iloc[:, :-1]
y = df.iloc[:,-1]
```

```
x
```

	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research
0	337	118	4	4.5	4.5	9.65	1
1	324	107	4	4.0	4.5	8.87	1
2	316	104	3	3.0	3.5	8.00	1
3	322	110	3	3.5	2.5	8.67	1
4	314	103	2	2.0	3.0	8.21	0
...	...	...	...	...	...	...	...
495	332	108	5	4.5	4.0	9.02	1
496	337	117	5	5.0	5.0	9.87	1
497	330	120	5	4.5	5.0	9.56	1
498	312	103	4	4.0	5.0	8.43	0
499	327	113	4	4.5	4.5	9.04	0

500 rows × 7 columns

```
y
```

```
0      0.92
1      0.76
2      0.72
3      0.80
4      0.65
       ...
495    0.87
496    0.96
```

```
497    0.93
498    0.73
499    0.84
Name: Chance of Admit , Length: 500, dtype: float64
```

```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(x, y, random_state = 123, test_size = 0.2)
```

```
X_train
```

	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research
199	313	107	3	4.0	4.5	8.69	0
450	320	112	4	3.0	4.5	8.86	1
231	319	106	3	3.5	2.5	8.33	1
95	304	100	4	1.5	2.5	7.84	0
54	322	110	3	3.0	3.5	8.00	0
...	...	...	...	...	...	...	...
98	332	119	4	5.0	4.5	9.24	1
476	304	104	3	2.5	2.0	8.12	0
322	314	107	2	2.5	4.0	8.27	0
382	324	110	4	4.5	4.0	9.15	1
365	330	114	4	4.5	3.0	9.17	1

400 rows × 7 columns

```
from sklearn.preprocessing import MinMaxScaler
scaler = MinMaxScaler()

X_train_scaled = scaler.fit_transform(X_train)
X_test_scaled  = scaler.transform(X_test)
```

```
X_train_scaled
```

```
array([[0.46      , 0.51851852, 0.5       , ..., 0.875     , 0.60576923,
        0.        ],
       [0.6       , 0.7037037 , 0.75      , ..., 0.875     , 0.66025641,
        1.        ],
       [0.58      , 0.48148148, 0.5       , ..., 0.375     , 0.49038462,
        1.        ],
       ...,
       [0.48      , 0.51851852, 0.25      , ..., 0.75      , 0.47115385,
        0.        ],
       [0.68      , 0.62962963, 0.75      , ..., 0.75      , 0.75320513,
        1.        ],
       [0.8       , 0.77777778, 0.75      , ..., 0.5       , 0.75961538,
        1.        ]])
```

```
from scipy.stats.morestats import optimize

ann = Sequential()

ann.add(Dense(units=7,activation="relu"))
ann.add(Dense(units=7,activation="relu"))

ann.add(Dense(units=1))
```

```
ann.compile(optimizer="adam", loss="mse")
history = ann.fit(X_train_scaled, y_train, epochs=100, validation_split = 0.2)
```

```
Epoch 72/100
10/10 [==============================] - 0s 4ms/step - loss: 0.0060 - val_loss: 0.0049
Epoch 73/100
10/10 [==============================] - 0s 5ms/step - loss: 0.0059 - val_loss: 0.0049
Epoch 74/100
10/10 [==============================] - 0s 7ms/step - loss: 0.0059 - val_loss: 0.0049
Epoch 75/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0059 - val_loss: 0.0048
Epoch 76/100
10/10 [==============================] - 0s 4ms/step - loss: 0.0059 - val_loss: 0.0049
Epoch 77/100
10/10 [==============================] - 0s 5ms/step - loss: 0.0058 - val_loss: 0.0049
Epoch 78/100
10/10 [==============================] - 0s 4ms/step - loss: 0.0058 - val_loss: 0.0048
Epoch 79/100
10/10 [==============================] - 0s 4ms/step - loss: 0.0057 - val_loss: 0.0048
Epoch 80/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0057 - val_loss: 0.0048
Epoch 81/100
10/10 [==============================] - 0s 4ms/step - loss: 0.0057 - val_loss: 0.0048
Epoch 82/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0057 - val_loss: 0.0048
Epoch 83/100
10/10 [==============================] - 0s 4ms/step - loss: 0.0056 - val_loss: 0.0048
Epoch 84/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0056 - val_loss: 0.0048
Epoch 85/100
10/10 [==============================] - 0s 4ms/step - loss: 0.0056 - val_loss: 0.0048
Epoch 86/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0056 - val_loss: 0.0048
Epoch 87/100
10/10 [==============================] - 0s 5ms/step - loss: 0.0055 - val_loss: 0.0048
Epoch 88/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0055 - val_loss: 0.0048
Epoch 89/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0055 - val_loss: 0.0048
Epoch 90/100
10/10 [==============================] - 0s 5ms/step - loss: 0.0055 - val_loss: 0.0047
Epoch 91/100
10/10 [==============================] - 0s 8ms/step - loss: 0.0054 - val_loss: 0.0047
Epoch 92/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0054 - val_loss: 0.0047
Epoch 93/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0054 - val_loss: 0.0047
Epoch 94/100
10/10 [==============================] - 0s 7ms/step - loss: 0.0054 - val_loss: 0.0047
Epoch 95/100
10/10 [==============================] - 0s 5ms/step - loss: 0.0053 - val_loss: 0.0047
Epoch 96/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0053 - val_loss: 0.0047
Epoch 97/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0053 - val_loss: 0.0047
Epoch 98/100
10/10 [==============================] - 0s 5ms/step - loss: 0.0053 - val_loss: 0.0047
Epoch 99/100
10/10 [==============================] - 0s 6ms/step - loss: 0.0053 - val_loss: 0.0047
Epoch 100/100
10/10 [==============================] - 0s 4ms/step - loss: 0.0053 - val_loss: 0.0046
```

```
y_pred = ann.predict(X_test_scaled)
```

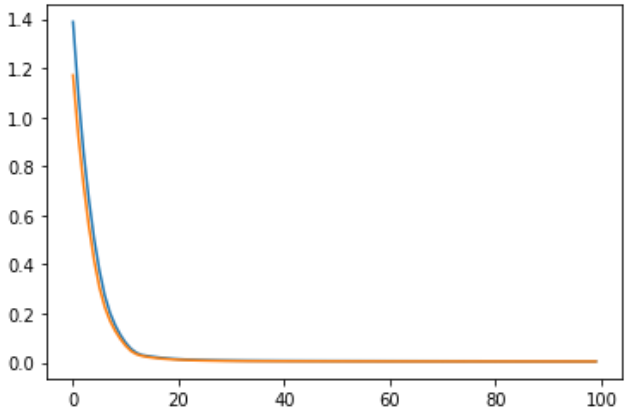
```
4/4 [==============================] - 0s 3ms/step
```

```
from sklearn.metrics import r2_score
r2_score(y_test, y_pred)
```

```
0.7501322822487431
```

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

```
[<matplotlib.lines.Line2D at 0x7fd5a55eaca0>]
```




```
```

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