

```
import tensorflow
```

```
tensorflow.__version__
```

```
'2.7.0'
```

```
import pandas as pd
```

```
import numpy as np
```

```
import matplotlib.pyplot as plt
```

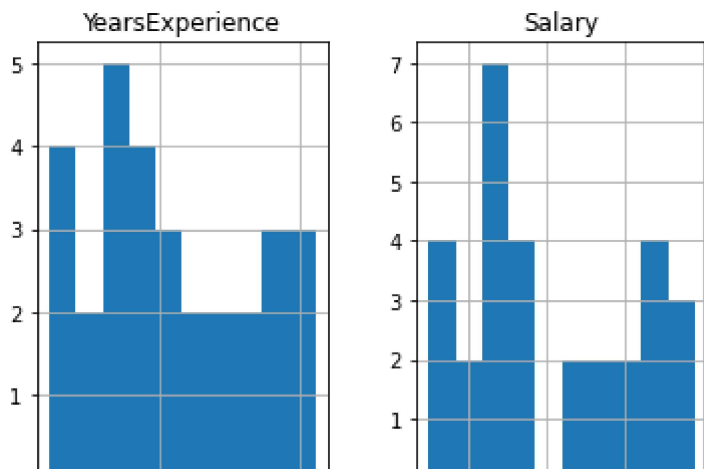
```
data=pd.read_csv(r"/Salary_Data (1).csv")
```

```
data.describe
```

	<bound method NDFrame.describe of	YearsExperience	Salary
0	1.1	39343.0	
1	1.3	46205.0	
2	1.5	37731.0	
3	2.0	43525.0	
4	2.2	39891.0	
5	2.9	56642.0	
6	3.0	60150.0	
7	3.2	54445.0	
8	3.2	64445.0	
9	3.7	57189.0	
10	3.9	63218.0	
11	4.0	55794.0	
12	4.0	56957.0	
13	4.1	57081.0	
14	4.5	61111.0	
15	4.9	67938.0	
16	5.1	66029.0	
17	5.3	83088.0	
18	5.9	81363.0	
19	6.0	93940.0	
20	6.8	91738.0	
21	7.1	98273.0	
22	7.9	101302.0	
23	8.2	113812.0	
24	8.7	109431.0	
25	9.0	105582.0	
26	9.5	116969.0	
27	9.6	112635.0	
28	10.3	122391.0	
29	10.5	121872.0>	

```
data.hist()
```

```
array([[<matplotlib.axes._subplots.AxesSubplot object at 0x7f1b6e7a9750>,
       <matplotlib.axes._subplots.AxesSubplot object at 0x7f1b6e33cc50>]],
      dtype=object)
```



Split Data

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

y

```
array([ 39343.,  46205.,  37731.,  43525.,  39891.,  56642.,  60150.,
        54445.,  64445.,  57189.,  63218.,  55794.,  56957.,  57081.,
        61111.,  67938.,  66029.,  83088.,  81363.,  93940.,  91738.,
        98273., 101302., 113812., 109431., 105582., 116969., 112635.,
        122391., 121872.])
```

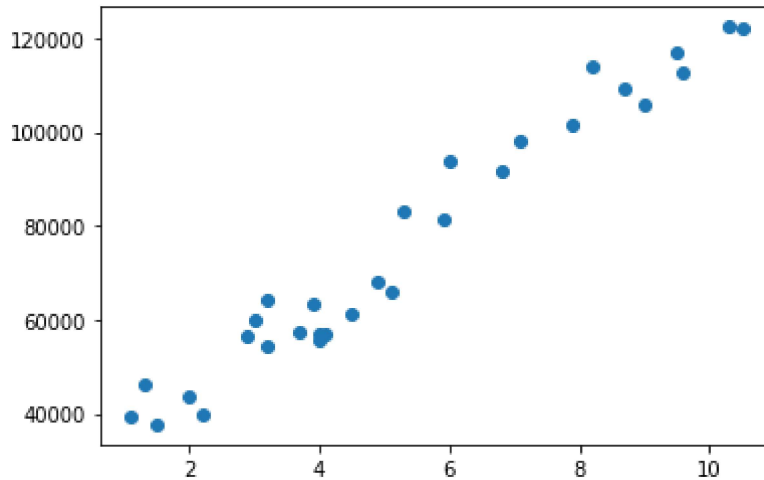
x

```
array([[ 1.1],
       [ 1.3],
       [ 1.5],
       [ 2. ],
       [ 2.2],
       [ 2.9],
       [ 3. ],
       [ 3.2],
       [ 3.2],
       [ 3.7],
       [ 3.9],
       [ 4. ],
       [ 4. ],
       [ 4.1],
       [ 4.5],
       [ 4.9],
       [ 5.1],
       [ 5.3],
       [ 5.9],
       [ 6. ],
       [ 6.8],
```

```
[ 7.1],
[ 7.9],
[ 8.2],
[ 8.7],
[ 9. ],
[ 9.5],
[ 9.6],
[10.3],
[10.5]])
```

```
plt.scatter(x,y)
```

```
<matplotlib.collections.PathCollection at 0x7f1b650e8f50>
```



```
from sklearn.preprocessing import MinMaxScaler
scale =MinMaxScaler()
x_scal=scale.fit_transform(x)
```

```
x_scal
```

```
array([[0.        ],
       [0.0212766 ],
       [0.04255319],
       [0.09574468],
       [0.11702128],
       [0.19148936],
       [0.20212766],
       [0.22340426],
       [0.22340426],
       [0.27659574],
       [0.29787234],
       [0.30851064],
       [0.30851064],
       [0.31914894],
       [0.36170213],
       [0.40425532],
       [0.42553191],
       [0.44680851],
       [0.5106383  ],
```

```
[0.5212766 ],
[0.60638298],
[0.63829787],
[0.72340426],
[0.75531915],
[0.80851064],
[0.84042553],
[0.89361702],
[0.90425532],
[0.9787234 ],
[1.         ]])
```

```
from sklearn.model_selection import train_test_split
```

```
x_train, x_test, y_train, y_test = train_test_split(x_scal, y, test_size=0.1, random_state=12
```

Model

```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense
```

```
model=Sequential()
model.add(Dense(4,activation="sigmoid"))
model.add(Dense(2,activation="sigmoid"))
model.add(Dense(1))
```

```
model.compile(optimizer="rmsprop",loss="mse")
```

```
model.fit(x_train,y_train,epochs=200,batch_size=5)
```

```
Epoch 1/200
6/6 [=====] - 1s 4ms/step - loss: 6446664192.0000
Epoch 2/200
6/6 [=====] - 0s 6ms/step - loss: 6446659072.0000
Epoch 3/200
6/6 [=====] - 0s 5ms/step - loss: 6446655488.0000
Epoch 4/200
6/6 [=====] - 0s 4ms/step - loss: 6446652928.0000
Epoch 5/200
6/6 [=====] - 0s 4ms/step - loss: 6446651392.0000
Epoch 6/200
6/6 [=====] - 0s 4ms/step - loss: 6446648320.0000
Epoch 7/200
6/6 [=====] - 0s 4ms/step - loss: 6446645248.0000
Epoch 8/200
6/6 [=====] - 0s 4ms/step - loss: 6446641664.0000
Epoch 9/200
6/6 [=====] - 0s 4ms/step - loss: 6446639616.0000
Epoch 10/200
```

```

6/6 [=====] - 0s 4ms/step - loss: 6446636544.0000
Epoch 11/200
6/6 [=====] - 0s 4ms/step - loss: 6446632960.0000
Epoch 12/200
6/6 [=====] - 0s 4ms/step - loss: 6446630912.0000
Epoch 13/200
6/6 [=====] - 0s 4ms/step - loss: 6446628352.0000
Epoch 14/200
6/6 [=====] - 0s 3ms/step - loss: 6446625280.0000
Epoch 15/200
6/6 [=====] - 0s 5ms/step - loss: 6446622720.0000
Epoch 16/200
6/6 [=====] - 0s 7ms/step - loss: 6446619648.0000
Epoch 17/200
6/6 [=====] - 0s 3ms/step - loss: 6446616576.0000
Epoch 18/200
6/6 [=====] - 0s 4ms/step - loss: 6446614528.0000
Epoch 19/200
6/6 [=====] - 0s 5ms/step - loss: 6446610432.0000
Epoch 20/200
6/6 [=====] - 0s 6ms/step - loss: 6446607872.0000
Epoch 21/200
6/6 [=====] - 0s 3ms/step - loss: 6446605312.0000
Epoch 22/200
6/6 [=====] - 0s 3ms/step - loss: 6446601728.0000
Epoch 23/200
6/6 [=====] - 0s 6ms/step - loss: 6446599168.0000
Epoch 24/200
6/6 [=====] - 0s 6ms/step - loss: 6446596096.0000
Epoch 25/200
6/6 [=====] - 0s 5ms/step - loss: 6446593536.0000
Epoch 26/200
6/6 [=====] - 0s 7ms/step - loss: 6446589952.0000
Epoch 27/200
6/6 [=====] - 0s 3ms/step - loss: 6446586880.0000
Epoch 28/200
6/6 [=====] - 0s 6ms/step - loss: 6446584320.0000
Epoch 29/200
6/6 [=====] - 0s 6ms/step - loss: 6446581760.0000
Epoch 30/200

```

```
model.history.history
```

```

{'loss': [6446664192.0,
6446659072.0,
6446655488.0,
6446652928.0,
6446651392.0,
6446648320.0,
6446645248.0,
6446641664.0,
6446639616.0,
6446636544.0,
6446632960.0,
6446630912.0,
6446628352.0,
6446625280.0,

```

```

6446622720.0,
6446619648.0,
6446616576.0,
6446614528.0,
6446610432.0,
6446607872.0,
6446605312.0,
6446601728.0,
6446599168.0,
6446596096.0,
6446593536.0,
6446589952.0,
6446586880.0,
6446584320.0,
6446581760.0,
6446578688.0,
6446575616.0,
6446572544.0,
6446569472.0,
6446566400.0,
6446562816.0,
6446560256.0,
6446557184.0,
6446554624.0,
6446551040.0,
6446547968.0,
6446545920.0,
6446542848.0,
6446539264.0,
6446535168.0,
6446533632.0,
6446530560.0,
6446526976.0,
6446523904.0,
6446521344.0,
6446517760.0,
6446514688.0,
6446511616.0,
6446508032.0,
6446505472.0,
6446502400.0,
6446499840.0,
6446496768.0,
6446493184.0,
6446490112.0.

```

```

data_loss=model.history.history.get("loss")
data_loss

```

```

6446486016.0,
6446483968.0,
6446480896.0,
6446477824.0,
6446475264.0,
6446471680.0,

6446468608.0,
6446465536.0,
6446462464.0,

```

```

0440402404.0,
6446459392.0,
6446456320.0,
6446452736.0,
6446449664.0,
6446446592.0,
6446444032.0,
6446439936.0,
6446436864.0,
6446434816.0,
6446431744.0,
6446428160.0,
6446425088.0,
6446422528.0,
6446419456.0,
6446415872.0,
6446412800.0,
6446409728.0,
6446406144.0,
6446403584.0,
6446400512.0,
6446397440.0,
6446394880.0,
6446390784.0,
6446387712.0,
6446385152.0,
6446382080.0,
6446379008.0,
6446375936.0,
6446372864.0,
6446370304.0,
6446366720.0,
6446363648.0,
6446361088.0,
6446358016.0,
6446354944.0,
6446351360.0,
6446348288.0,
6446345728.0,
6446343168.0,
6446339584.0,
6446337024.0,
6446333440.0,
6446330880.0,
6446327296.0,
6446324736.0,
6446321152.0,
6446318592.0,
6446316544.0,
6446312960.0,
6446309888.0,
6446306816.0

```

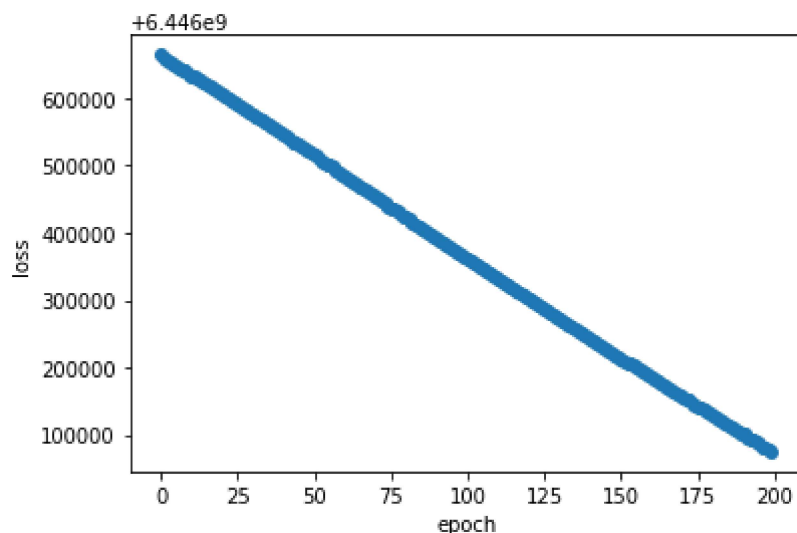
```
model.predict(x_test)
```

```

array([[4.715582 ],
       [4.721156 ],
       [4.7151623]], dtype=float32)

```

```
import matplotlib.pyplot as plt
plt.plot(data_loss, marker='o')
plt.xlabel("epoch")
plt.ylabel("loss")
plt.show()
```



```
from sklearn.metrics import explained_variance_score

explained_variance_score(y_test, model.predict(x_test))
```

```
1.7394825246874746e-07
```

```
y_pred = model.predict(x_test)
```

```
result=pd.DataFrame(y_pred, columns=["y_pred"])
```

```
result["y_test"]=y_test
```

```
result["error"] = (result["y_test"] - result["y_pred"])
```

```
result
```


	y_pred	y_test	error
0	4.715582	54445.0	54440.284418
1	4.721156	121872.0	121867.278844
2	4.715162	56642.0	56637.284838

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