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Multiple Linear Regression practice and assignment solve in video

In [22]:
```
#importing libraries

import numpy as np
import pandas as pd
from sklearn.linear_model import LinearRegression
import matplotlib.pyplot as plt
```

In [3]:
```
# load the data set
df = pd.read_csv("ml_data_salary.csv")
df.head()
```

Out[3]:

	age	distance	YearsExperience	Salary
0	31.1	77.75	1.1	39343
1	31.3	78.25	1.3	46205
2	31.5	78.75	1.5	37731
3	32.0	80.00	2.0	43525
4	32.2	80.50	2.2	39891

In [4]:
```
x = df[["age","distance","YearsExperience"]]
y = df[["Salary"]]
```

In [5]:
```
x.head()
```

Out[5]:

	age	distance	YearsExperience
0	31.1	77.75	1.1
1	31.3	78.25	1.3
2	31.5	78.75	1.5
3	32.0	80.00	2.0
4	32.2	80.50	2.2

In [6]:
```
y.head()
```

Out[6]:

	Salary
0	39343
1	46205
2	37731
3	43525

	Salary
4	39891

In [7]:
```
# create and fit your model

model = LinearRegression().fit(x,y)
model
```

Out[7]:
```
LinearRegression()
```

In [9]:
```
model.coef_
```

Out[9]:
```
array([[-2.79782201e+15,  1.10953700e+15,  2.39795093e+13]])
```

In [10]:
```
model.intercept_
```

Out[10]:
```
array([7.19385278e+14])
```

In [13]:
```
model.predict([[31.1,77.75,1.1]])
```

Out[13]:
```
array([[36205.]])
```

Assignment How to plot multiple linear regression

How to test the efficasy of model

In [16]:
```
from sklearn.model_selection import train_test_split
X_train,X_test,y_train,y_test = train_test_split(x,y, test_size=0.2, random_state=0)
```

In [17]:
```
reg = LinearRegression().fit(x,y)
reg
```

Out[17]:
```
LinearRegression()
```

In [20]:
```
print("Test Score = ", reg.score(X_test,y_test))
print("Train Score = ", reg.score(X_train,y_train))
```

```
Test Score =  0.9899070175292369
Train Score =  0.9408786543381286
```

In [21]:
```
model.score(x,y)
```

Out[21]:
```
0.9569671832087255
```

Visualize

In [36]:

```
from mpl_toolkits.mplot3d import Axes3D
print("X_train = ",len(X_train))
print("y_train = ",len(y_train))

fig = plt.figure()
ax = fig.add_subplot(111, projection = "3d")

x1 = X_train["age"]
x2 = X_train["YearsExperience"]
x3 = X_train["distance"]
# ax.scatter3D(x1 , x2 , x3 , c = y_train , cmap = "Greens")
ax.scatter3D(x1 , x2 , x3 , c = y_train , cmap = "viridis")
plt.show()
```

```
X_train =  24
y_train =  24
```