In [1]:

```python
import pandas as pd
def predict(row,coefficents):
    yhat=coefficents[0]
    for i in range(len(row)-1):
        yhat+=coefficents[i+1]*row[i]
    return yhat
def sgd(train,learning_rate,epochs):
    coef=[0.0 ]*len(train.columns)
    for epoch in range(epochs):
        sum_error=0
        for row in range(len(train.index)):
            yhat=predict(train.iloc[row,:], coef)
            error=yhat-train.iloc[row,:][-1]
            sum_error+=error**2
            coef[0]=coef[0]-learning_rate*error
            for i in range(len(train.columns)-1):
                coef[i+1]=coef[i+1]-learning_rate*error*train.iloc[row,i]
        print("epoch=%d,learning_rate=%.3f,error=%.3f"%(epoch,learning_rate,sum_error))
    return coef
df=pd.read_csv("Z:/College/3.2/ML LAB/Final lab/datasets/salary_data.csv")
learning_rate=0.001
epochs=75
coef=sgd(df,learning_rate,epochs)
print("coefficents:",coef)
```

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epoch=0,learning_rate=0.001,error=86312423380.185
epoch=1,learning_rate=0.001,error=14521338864.974
epoch=2,learning_rate=0.001,error=6057784502.274
epoch=3,learning_rate=0.001,error=4799377000.244
epoch=4,learning_rate=0.001,error=4517901271.619
epoch=5,learning_rate=0.001,error=4413628522.724
epoch=6,learning_rate=0.001,error=4352395422.095
epoch=7,learning_rate=0.001,error=4303804249.759
epoch=8,learning_rate=0.001,error=4259451136.909
epoch=9,learning_rate=0.001,error=4216794305.882
epoch=10,learning_rate=0.001,error=4175036669.937
epoch=11,learning_rate=0.001,error=4133922439.360
epoch=12,learning_rate=0.001,error=4093366182.171
epoch=13,learning_rate=0.001,error=4053336367.506
epoch=14,learning_rate=0.001,error=4013818582.567
epoch=15,learning_rate=0.001,error=3974803891.494
epoch=16,learning_rate=0.001,error=3936285148.377
epoch=17,learning_rate=0.001,error=3898255828.807
epoch=18,learning_rate=0.001,error=3860709659.078
epoch=19,learning_rate=0.001,error=3823640498.067
epoch=20,learning_rate=0.001,error=3787042299.139
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epoch=34,learning_rate=0.001,error=3320912331.221
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epoch=37,learning_rate=0.001,error=3231433380.338
epoch=38,learning_rate=0.001,error=3202362335.711
epoch=39,learning_rate=0.001,error=3173660972.781
epoch=40,learning_rate=0.001,error=3145324609.240
epoch=41,learning_rate=0.001,error=3117348621.973
epoch=42,learning_rate=0.001,error=3089728446.300
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epoch=46,learning_rate=0.001,error=2982716570.329
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epoch=48,learning_rate=0.001,error=2931230993.189
epoch=49,learning_rate=0.001,error=2905978443.994
epoch=50,learning_rate=0.001,error=2881047206.176
epoch=51,learning_rate=0.001,error=2856433208.898
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epoch=56,learning_rate=0.001,error=2737982917.804
epoch=57,learning_rate=0.001,error=2715189713.258
epoch=58,learning_rate=0.001,error=2692686658.609
epoch=59,learning_rate=0.001,error=2670470077.000
epoch=60,learning_rate=0.001,error=2648536338.060
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epoch=61,learning_rate=0.001,error=2626881857.325
epoch=62,learning_rate=0.001,error=2605503095.651
epoch=63,learning_rate=0.001,error=2584396558.644
epoch=64,learning_rate=0.001,error=2563558796.098
epoch=65,learning_rate=0.001,error=2542986401.431
epoch=66,learning_rate=0.001,error=2522676011.139
epoch=67,learning_rate=0.001,error=2502624304.249
epoch=68,learning_rate=0.001,error=2482828001.784
epoch=69,learning_rate=0.001,error=2463283866.231
epoch=70,learning_rate=0.001,error=2443988701.017
epoch=71,learning_rate=0.001,error=2424939349.994
epoch=72,learning_rate=0.001,error=2406132696.926
epoch=73,learning_rate=0.001,error=2387565664.986
epoch=74,learning_rate=0.001,error=2369235216.259
coefficents: [11203.722800070218, 11321.000750769897]
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In [ ]: