EXPERIMENT NO. 3.

SIMPLE LIEAR REGRATION

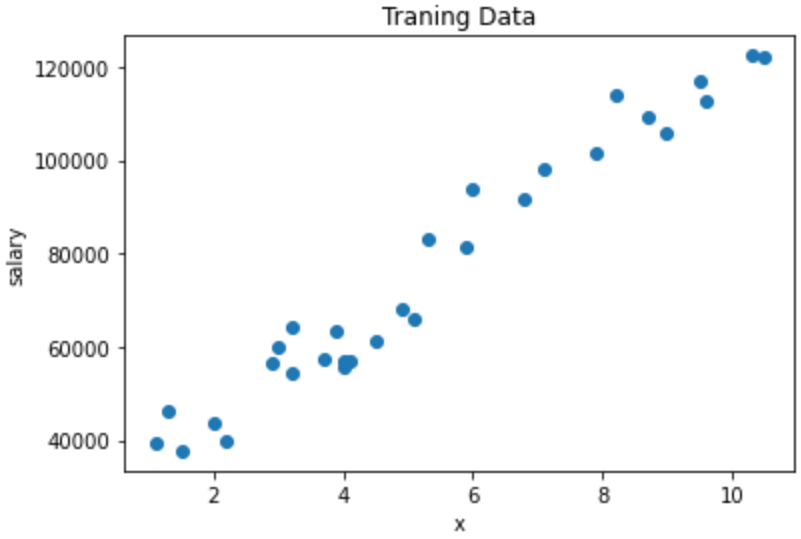
IMPORT THE DATA FILE FROM PC AND PLOT ON MATPLOT

In [12]:

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

plt.rcParams["figure.figsize"]=(6.0, 4.0)


data =pd.read_csv('Salary_Data.csv')
x=data.iloc[:,0]
y=data.iloc[:,1]
plt.scatter(x,y)
plt.xlabel('x')
plt.ylabel('salary')
plt.title('Traning Data')
plt.show()
```



INITIALIZAYION OF VALUES

In [13]:

```
theta0 = 1.86938628297
theta1 = 50.011412628146

alpha = 0.0001

m = float(len(X))# no of samples in data set get it
epsilon = 0.00001
CostOld = 9999
diff = 1
iteration = 1
```

PREDICTING THE HOYOTHESIS

In [14]:
```
while abs(diff) > epsilon:          #diff is toooo small then stop itteration
                                    #automatic convergence test ACT some threshold should
    Y_pred = theta1 * X + theta0    #h theta(x)=o0+o1x) and prediction for all vector X sa
    Cost = (1 / m) * sum((Y_pred - Y) ** 2)#X&Y capital is all vector not single entity
    #   print(Cost)

    D_theta1 = (1 / m) * sum(X * (Y_pred - Y))# partial derivative wrt to theta1
    D_theta0 = (1 / m) * sum(Y_pred - Y)
    theta1 = theta1 - alpha * D_theta1
    theta0 = theta0 - alpha * D_theta0
    #print(cost)
    diff = CostOld - Cost
    #   print(diff)

    CostOld = Cost
    iteration = iteration + 1
    # plt.scatter(X,Y)
    # plt.plot([min(X), max(X)],[min(Y_pred),max (Y_pred)], color='red')
    # plt.show()
```

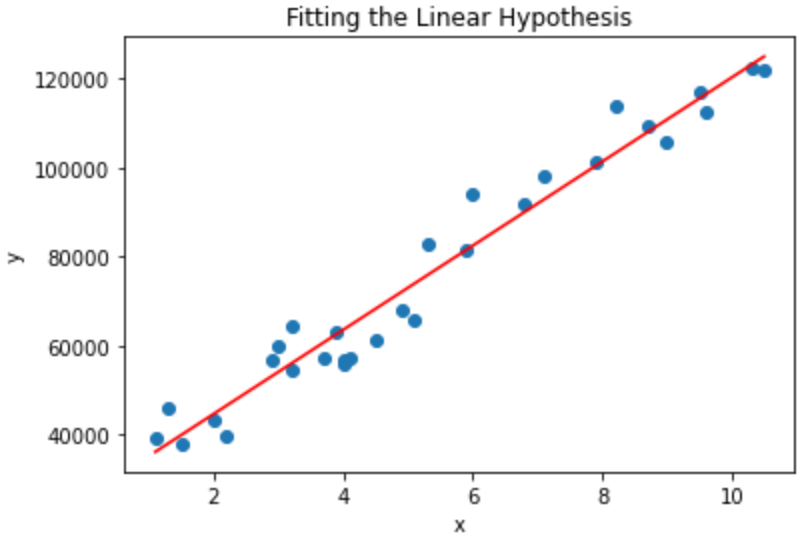
PRINTING THE PLOTS OF PREDICTED HYPOTHESIS

In [15]:
```
print('Iteration = ', str(iteration))
print("theta0 = ", theta0, ",theta1 = ", theta1)


plt.scatter(X, Y)
plt.plot(X, Y_pred, color='red')
plt.xlabel('x')
plt.ylabel('y')
plt.title('Fitting the Linear Hypothesis')
plt.show()


test_X =float(input ("enter no of year "))#1.2 #initializing the value of (x theta1 *x)
Y_pred = theta1 * test_X + theta0
print('salary prediction for exprience of ', str(test_X), 'year = ', round(Y_pred,2))
```

```
Iteration =  474369
theta0 =  25791.152851516217 ,theta1 =  9450.117743387711
```




```
enter no of year 1.3
```

```
salary prediction for exprience of  1.3 year =  38076.31
```

COMPARING WITH ACTUAL VALUES THE PREDICTED VALUE

In [ ]:

```
data
print('salary preducted for ',test_X 'years is ',Y_pred)
```

In [ ]:

```

```