

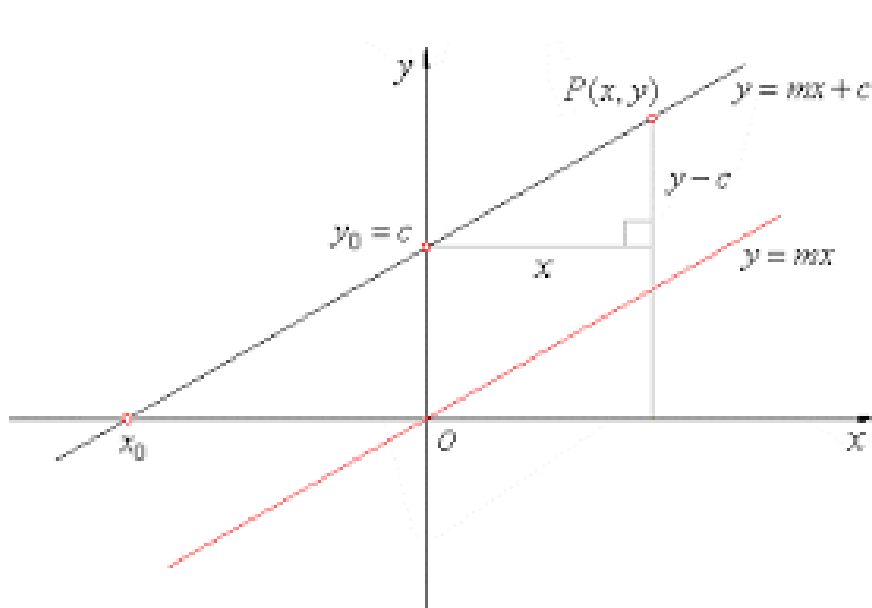
Aim: To find the parameters or coefficients of a function where the function has a minimum value using gradient Descent Optimizations algorithms

Tools: Python, Matplotlib

Theory: A linear regression model attempts to explain the relationship between a dependent variable and one or more independent variables using a straight line. The line can be represented using the equation of

$$y = mx + c$$

‘y’ being the dependent variable and ‘x’ as independent. ‘m’ is the slope of the line and ‘c’ as the y intercept.



Our goal is to minimize this error to obtain the most accurate value of m and c.

Step1. Find the difference between the actual y and predicted y value($y = mx + c$), for a given x.

Step2. Square this difference.

Step3. Find the mean of the squares for every value in X.

Gradient Descent Algorithm

1. Initially let $m = 0$ and $c = 0$. Let L be our learning rate, let's set it to 0.0001 for good accuracy.

2. Calculate the partial derivative of the loss function with respect to m, and plug in the current values of x, y, m and c in it to obtain the derivative value D.

3. Now we update the current value of m and c using the following equation.

4. We repeat this process until our loss function is a very small.