Gradient Descent:

Regular Problem Solving:

Graphical user interface, text, application, chat or text message

Description automatically generated

Machine Learning:

Text, whiteboard

Description automatically generated

Example: Home Price Prediction

Graphical user interface, text, application, chat or text message

Description automatically generated

Input:

Chart

Description automatically generated

All Possible Lines:

Chart, line chart

Description automatically generated

Assume One line is best fit line:

Chart, line chart

Description automatically generated

How to find Best fit line: [ Low error or residual]

Chart, scatter chart

Description automatically generated

Based on Mean Squared Error (Cost function), we can find the best find:

Diagram

Description automatically generated

Diagram

Description automatically generated

From above approach we need to find best “m” and “b” values

It is very difficult and time-consuming process (All permutations and combinations).

With less iterations Gradient descent will give best fitted line:

Text

Description automatically generated with medium confidence

Chart, surface chart

Description automatically generated

Chart, surface chart

Description automatically generated

Fixed Step Approach:

Chart, line chart

Description automatically generated

We will never meet global minima (converse)

Instead of fixed steps, steps like below work good

Chart, line chart

Description automatically generated

But how to get steps like below:

A picture containing chart

Description automatically generated

Finding Slope : Reference: Math is fun

Chart

Description automatically generated

But how to find slope at small point without any measures:

Diagram

Description automatically generated

A picture containing graphical user interface

Description automatically generated

Graphical user interface, application

Description automatically generated

Graphical user interface, text

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

Partial Derivate:

Graphical user interface, text, application, email

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

Graphical user interface, text, application, email, Teams

Description automatically generated

Text

Description automatically generated

Text, letter

Description automatically generated

Diagram, schematic

Description automatically generated

Graphical user interface, text, application, chat or text message

Description automatically generated

Chart

Description automatically generated

Ref: https://www.youtube.com/watch?v=vsWrXfO3wWw