# Linear Regression

1. **Linear Regression** is a machine learning algorithm based on **supervised learning**. It performs a **regression task**.
2. Regression models a target prediction value based on independent variables. It is mostly used for finding out the relationship between variables and forecasting.
3. Linear regression performs the task to predict a dependent variable value (y) based on a given independent variable (x). So, this regression technique finds out a linear relationship between x (input) and y(output).
4. Y=θ1+θ2\*x

**x:** input training data (univariate – one input variable(parameter))  
**y:** labels to data (supervised learning)

**θ1:** intercept  
**θ2:** coefficient of x

1. **Cost Function (J):** By achieving the best-fit regression line, the model aims to predict y value such that the error difference between predicted value and true value is minimum. So, it is very important to update the θ1 and θ2 values, to reach the best value that minimize the error between predicted y value (pred) and true y value (y).

**J=1/n**