**Regression** - A mathematical equation that explains the relationship between the Input (independent) and output (dependent) features.

**Linear Regression**: A linear equation that best explains the relationship between the input (independent) and output (dependent) features.

Eg: y = f(x) = wx + b y = output (dependent) variable

X = input (independent) variable

W,b = parameters, also known as coefficients.

**Cost function:** The difference between the estimated value and actual value.

m

J(w,b) = (1/2m) \* [ Σ ( y^ (i) - y (i))^2 ] → Average squared error

→ y-hat of ith record = f(w,b)(x(i)

i=1

m

= (1/2m) \* [ Σ ( f(w,b)(x)(i) - y (i))^ 2 ] → y-hat of ith record = f(w,b)(x(i)

i=1

**Gradient Descent:** An optimization algorithm to determine the parameters (w,b) of a function with minimum cost.

W = w - α \* dJ\_dw dJ\_dw = derivative of cost function J wrt w.

B = b - α \* dJ\_db dJ\_db = derivative of cost function J wrt b

m

dJ\_dw = (1/m) \* [ Σ ( f(x)(i) - y(i) ) \* x(i)]

i=1

m

dJ\_db = (1/m) \* [ Σ ( f(x)(i) - y(i) )]

i=1