

# Machine Learning Algorithm

## 3. Polynomial Regression( Non-Linear Regression)

### 3.1 Prerequisites

- a . System ( Computer system)
- b . Python Interpreter ( Python 3 language skills, Pandas, Numpy, Scikit-learn etc)
- c . IDE software ( Jupyter Notebook or spider or pycharm or google collab etc)
- d . Data Sets ( single variable(X) input and single variable( Y) target)

### 2.2 Practical Daily Life or Business Uses

- a. Same type of domain but different values ( Ex- engineer: Mechanical, civil etc)
- b. Salary ( Ex- Teacher, headmaster, director etc.)
- c. Latest best example finding growth rate of COVID-19 etc.
- D. Growth rate of carbon in the environment etc.

### 3.3 Some Mathematical concept of this algorithm

- Simple Linear Regression formula in terms of machine learning.

$y = \beta_0 + \beta_1 x + \epsilon$  ( where  $y$ = output,  $x$ = input,  $\beta_1$ = slope,  $\beta_0$  = constant or intercept,  $\epsilon$  = Error term)

- Multiple Linear Regression formula in terms of machine learning.

$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \epsilon$  ( where  $y$ = output,  $x$ = input,  $\beta_1, \beta_2$ = slope,  $\beta_0$  = constant or intercept,  $\epsilon$  = Error term)

- Polynomial Regression formula in terms of machine learning.

$$y = \beta_0 + \beta_1 x + \beta_2 x^2 + \beta_3 x^3 + \dots + \beta_n x^n + \epsilon.$$