**Simple Linear Regression:**

* When the dependent variable depends on single independent variables then it is known as Simple linear regression.
* The key point in Simple Linear regression is that the dependent variable must be a continuous or real value and the independent variable can be measured in continuous or categorical values.
* The simple linear regression model can be represented by the following equation

y= a0 + a1x

**Multiple Linear regression:**

* Multiple linear regression models the relationship between a target variable and multiple independent variables.
* There should be little or no multicollinearity between independent variables in data

Multicollinearity:

* When two or more independent variables are highly correlated, it leads to multicollinearity, making it challenging to isolate the individual effects of each variable on the dependent variable.
* In other words, multicollinearity implies that some predictor variables can be predicted linearly from other variables.
* The multiple linear regression model can be represented by the following equation:

y = m1x1 + m2x2 + m3x3 + b

where, m = coefficient

x = weights

**Note: The Sklearn linear regression model is aware of the dummy variable trap, and it automatically drops one of the columns when OneHotEncoding is used**

**Polynomial Linear Regression:**

* Polynomial regression is a special case of multiple linear regression which is used for non-linear datasets.
* Polynomial terms are added to the multiple linear equations to convert it into a Polynomial linear equation.
* In polynomial regression, original features are converted into polynomial features of the required degree (2,3,4 …,n) and then modeled using a linear model.
* If we apply the linear model directly to the non-linear datasets, it will give output with less accuracy.
* **Polynomial Regression equation:**

**y= b0+m1x1 + m2x2+ m3x3+.... + mnxn**