**What is an Optimizer in DL:**

The process or an algorithm which will alter certain values like (Learning Rate, Regularization parameters & so on) so that the error gets reduced in the loss function, is called as an Optimizer.

There are different types of Optimizers available in DL, we can see about two Gradient Descent process in detail:

* **Gradient Descent (GD):**

The word ***Gradient*** refers to the slope of a function/ rate of change of one variable with respect to another variable.

The word ***Descent*** refers to moving downwards.

GD can be stated as, the first order derivative iterative optimisation technique which is used to find the global minima. The graph plotted on the results of this GD will always be a “***convex graph***”

Now we can see the 2 different types of optimizers available:

* **Stochastic Gradient Descent (SGD) &**
* **Batch Gradient Descent (BGD)**

**Stochastic Gradient Descent (SGD)**

The word **stochastic** refers to the randomness / uncertainty involved in the process. Thereby in Stochastic Gradient Descent few samples from the dataset are selected randomly for each iteration & processed towards finding the global minima.

Since the samples are shuffled up and collected in a random manner, the path towards finding the global minima, might be too clumsy.

Which is the time taken to find the global minima will be little long, Thereby in other words the number of iterations traversed will be large. Still this SGD is preferred widely as it is computationally less expensive when compared with BGD.

**Batch Gradient Descent (BGD)**

Similar to Gradient Descent the goal of the process is to find the global minima. As the name specifies “Batch” the entire dataset is used in the process for calculating the gradient and hence finding the global minima. The path traversed will be less clumsy as uncertainty / randomness as for all single iteration until global minima is reached, the entire dataset as a batch is taken for consideration.

In this we learnt what is optimizer & the two optimization techniques used in industry.