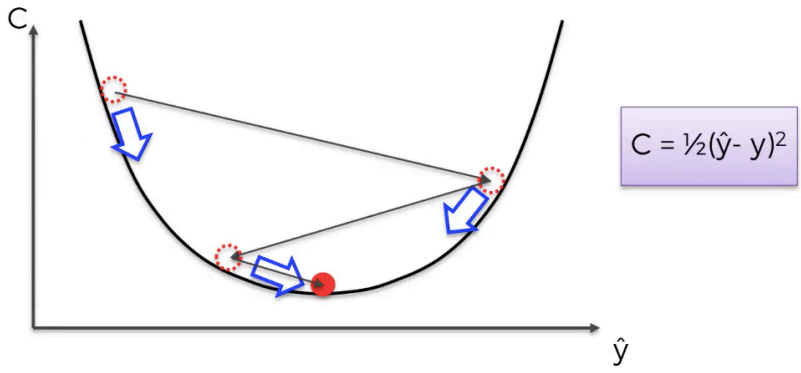
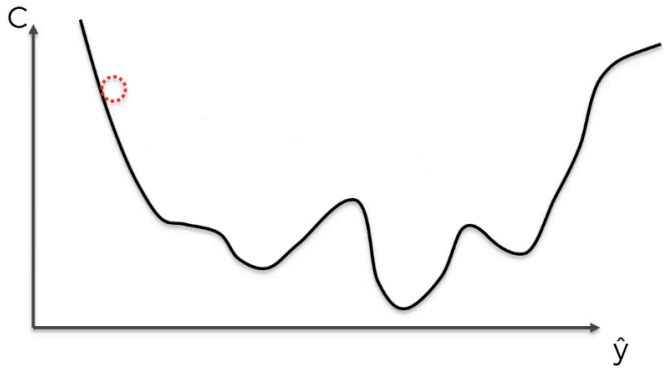
Stochastic Gradient Descent

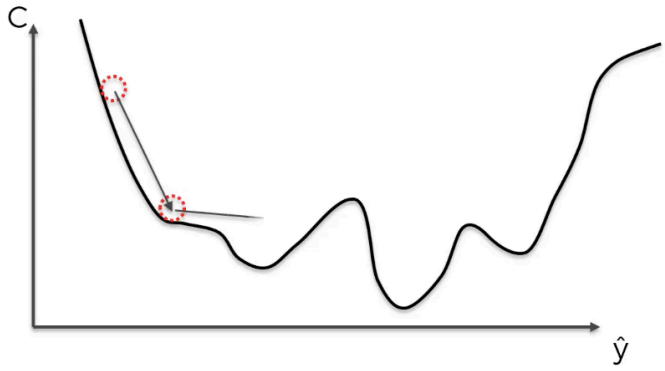
Stochastic Gradient Descent



Stochastic Gradient Descent



Stochastic Gradient Descent



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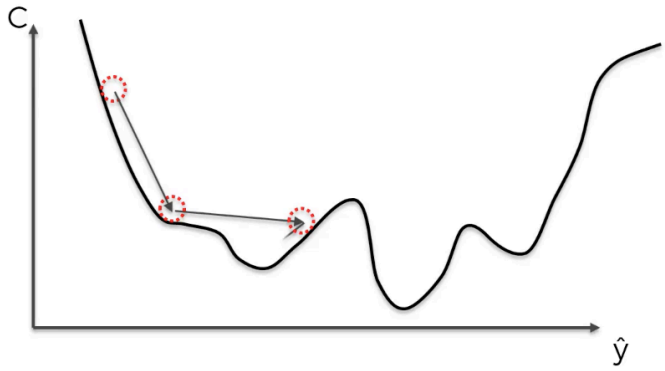
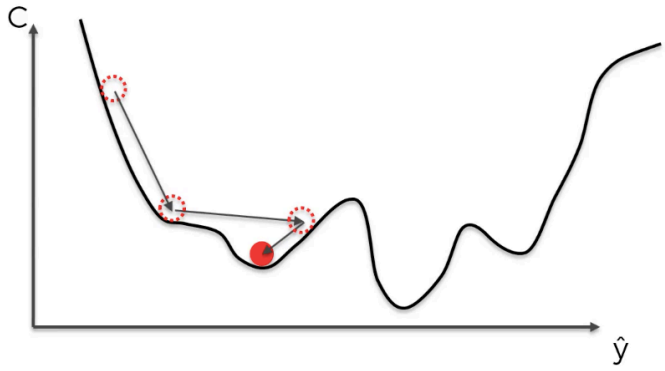
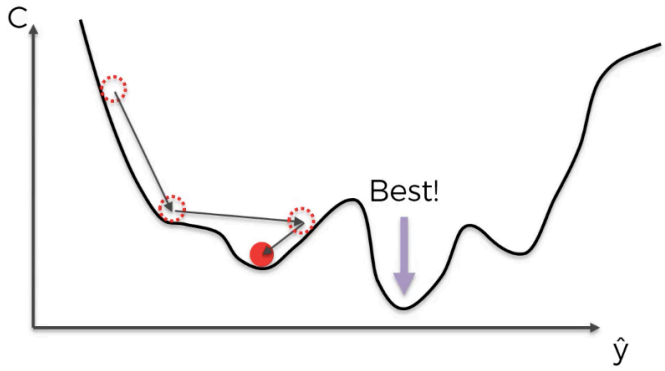


Stochastic Gradient Descent

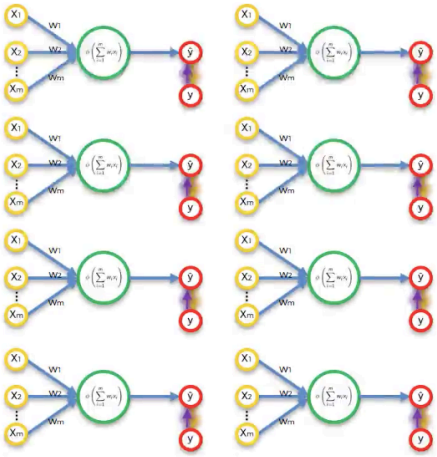


Stochastic Gradient Descent



In the normal gradient descent, there is a chance that we cannot find our actual minimum.

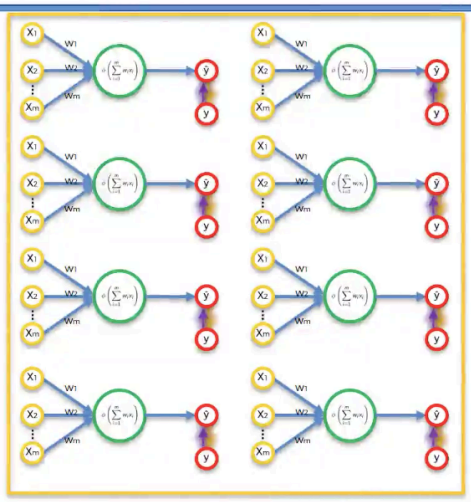
Stochastic Gradient Descent



Row ID	Study Hrs	Sleep Hrs	Quiz	Exam
1	12	6	78%	93%
2	22	6.5	24%	68%
3	115	4	100%	95%
4	31	9	67%	75%
5	0	10	58%	51%
6	5	8	78%	60%
7	92	6	82%	89%
8	57	8	91%	97%

$$C = \sum \tfrac{1}{2}(\hat{y} - y)^2$$

Stochastic Gradient Descent



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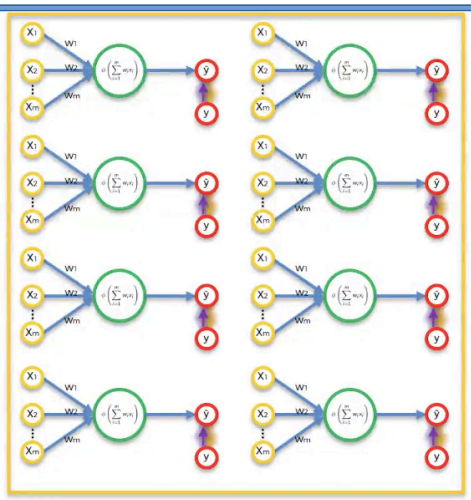
Stochastic Gradient Descent



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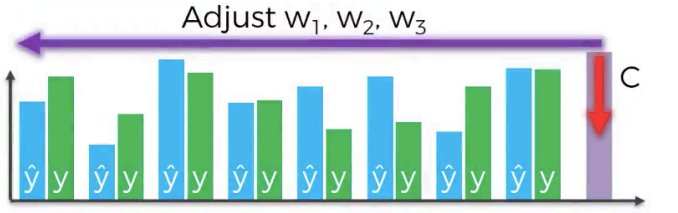
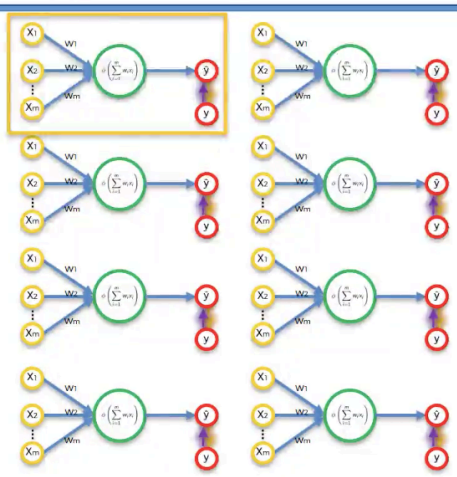


This is called gradient decent method or more properly batch gradient decent method.

Stochastic Gradient Descent



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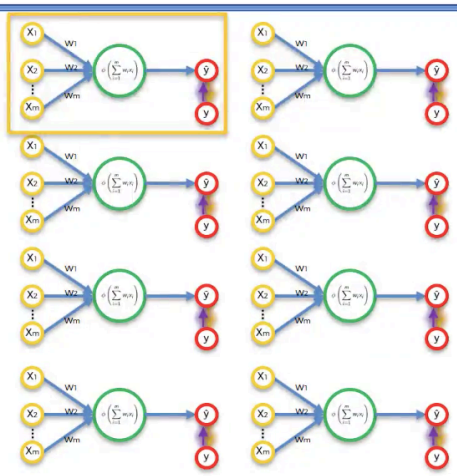
But in Stochastic gradient descent method, thigs are a little different. In here we adjusting the weights row by row.

Stochastic Gradient Descent



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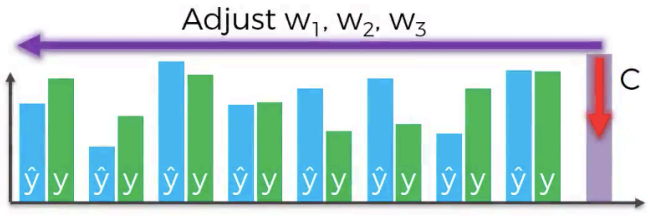
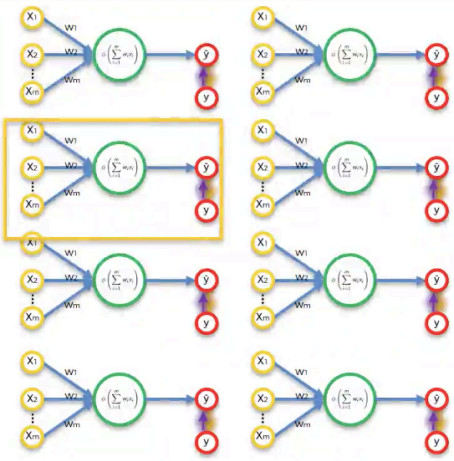


Stochastic Gradient Descent



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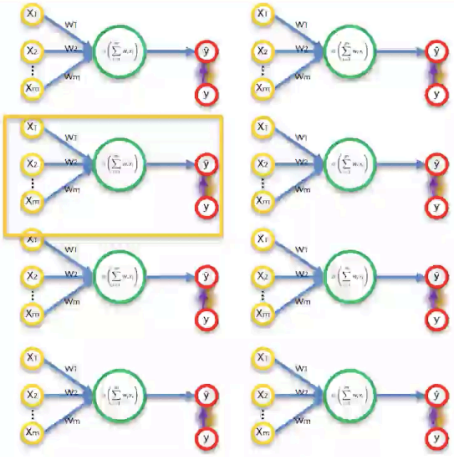
Stochastic Gradient Descent



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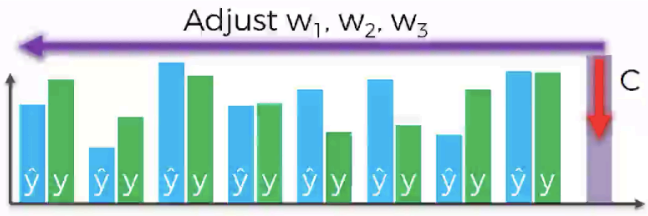

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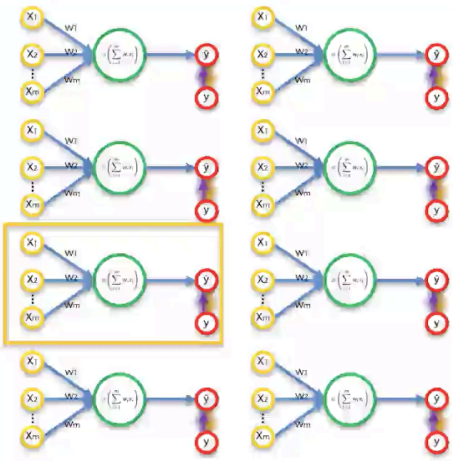

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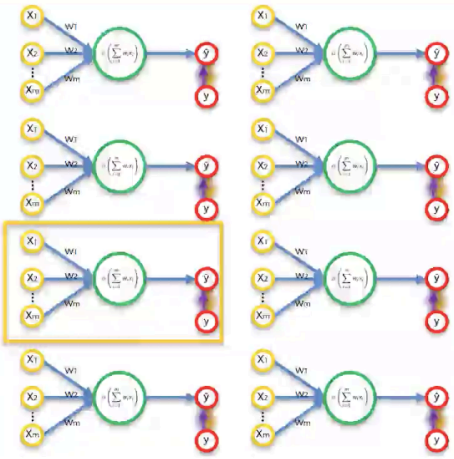

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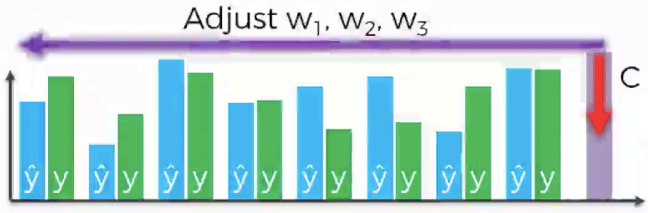

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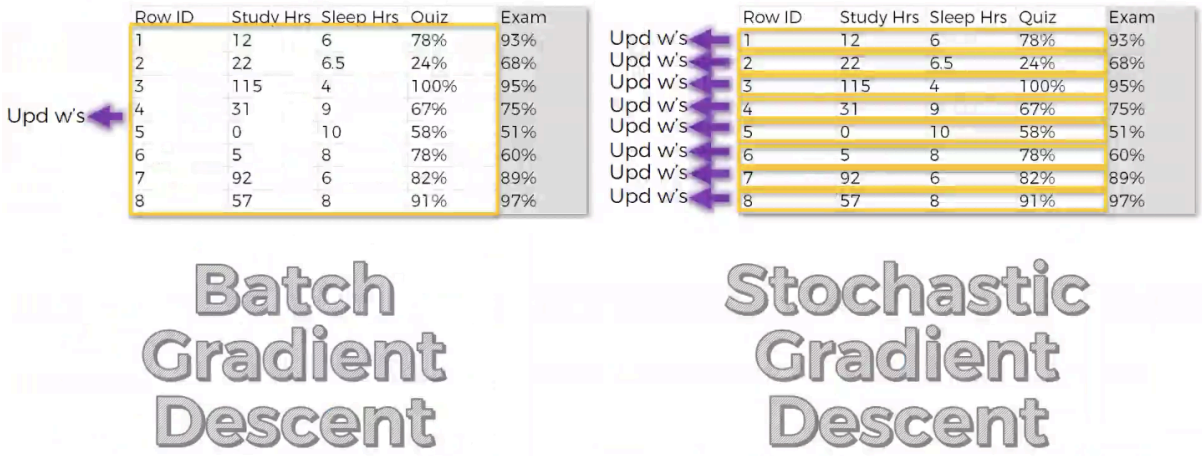


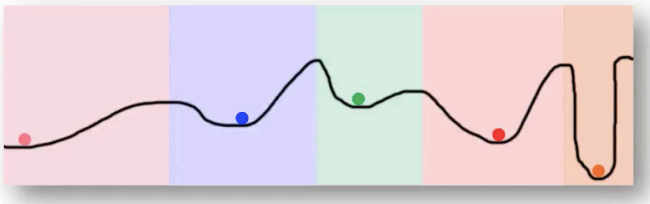
The advantage of Stochastic gradient descent over the batch gradient descent is that it can find the global minimum more accurately and it is faster.
The advantage of batch gradient descent is that it is deterministic rather than being based on probability.

Stochastic Gradient Descent

Additional Reading:

A Neural Network in 13 lines of Python (Part 2 - Gradient Descent)

Andrew Trask (2015)



Link:

https://iamtrask.github.io/2015/07/27/python-network-part2/

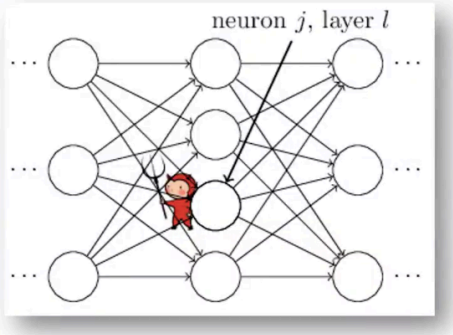
Stochastic Gradient Descent

Additional Reading:

Neural Networks and Deep Learning

Michael Nielsen (2015)

Link:



http://neuralnetworksanddeeplearning.com/chap2.html