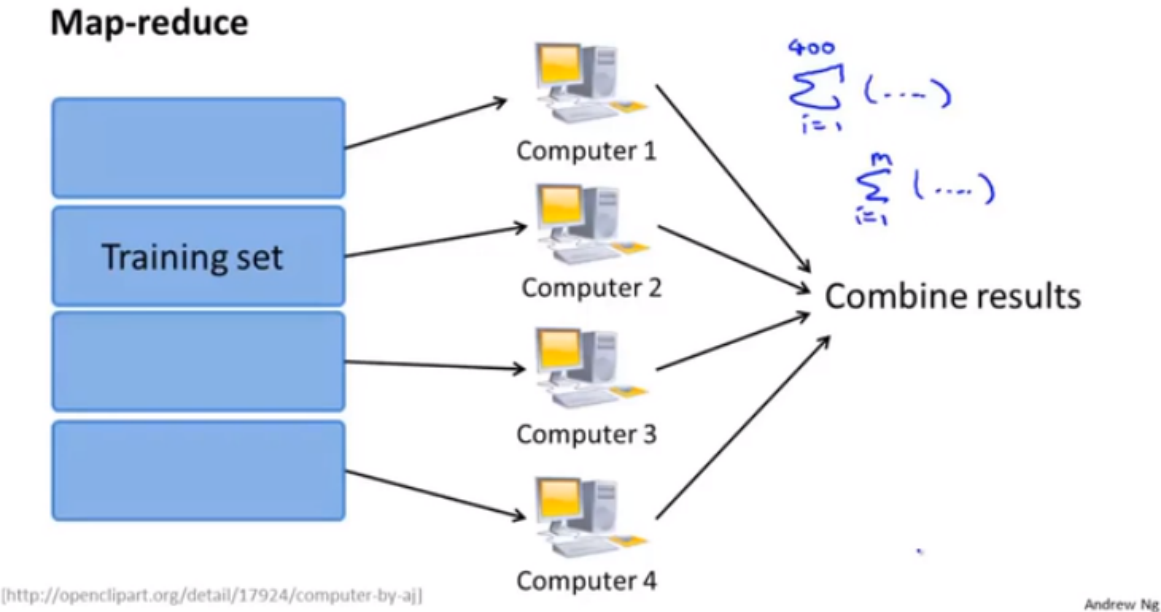
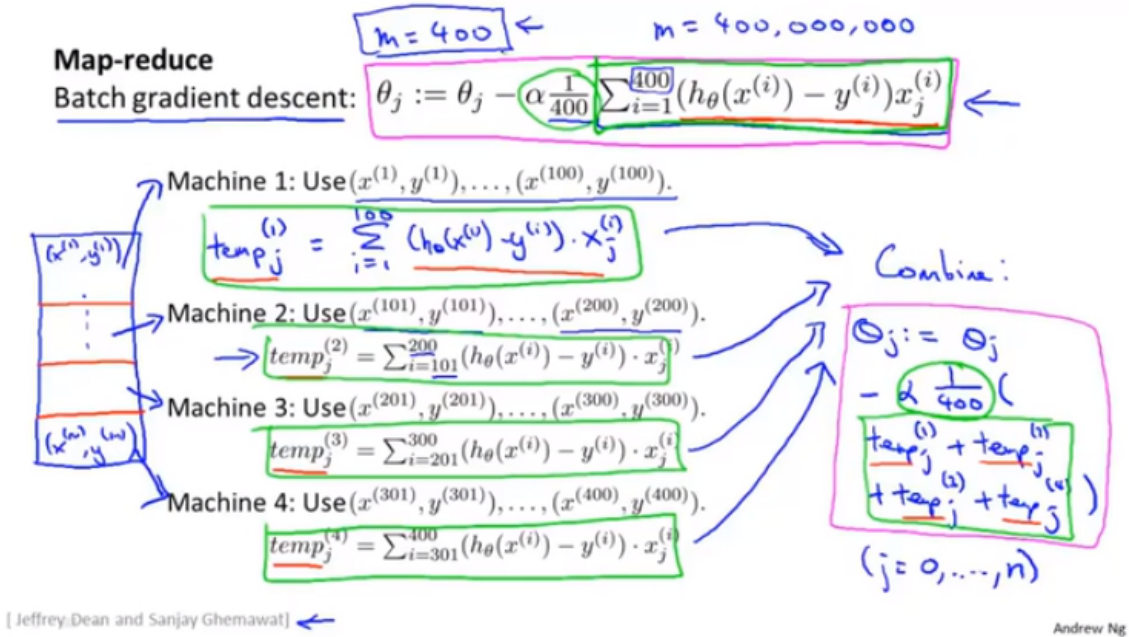


以批量梯度下降为例，先在四台机器上分别计算四部分训练集数据的运算，再发送到中心进行整合。



只要学习算法可以表达为一系列的求和形式，就可以使用MapReduce思想。

Map-reduce and summation over the training set

Many learning algorithms can be expressed as computing sums of functions over the training set.

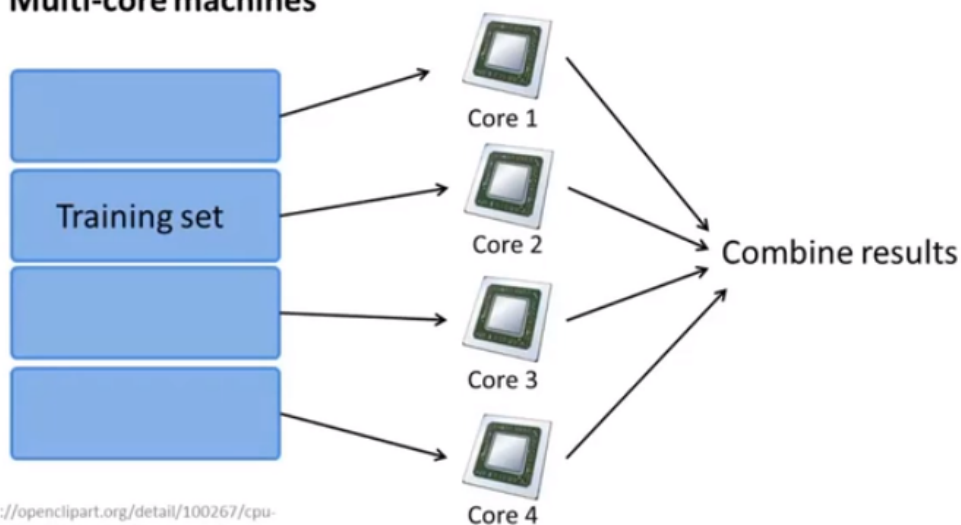
E.g. for advanced optimization, with logistic regression, need:

$$\rightarrow \underline{J_{train}(\theta) = -\frac{1}{m} \sum_{i=1}^m \underbrace{y^{(i)} \log h_{\theta}(x^{(i)}) - (1 - y^{(i)}) \log(1 - h_{\theta}(x^{(i)}))}_{\text{temp}^{(i)}}$$

$$\rightarrow \underline{\frac{\partial}{\partial \theta_j} J_{train}(\theta) = \frac{1}{m} \sum_{i=1}^m \underbrace{(h_{\theta}(x^{(i)}) - y^{(i)}) \cdot x_j^{(i)}}_{\text{temp}_j^{(i)}}$$

一个机器中多核实现MapReduce

Multi-core machines



[[http://opencitart.org/detail/100267/cpu-\(central-processing-unit\)-by-ivak-100267](http://opencitart.org/detail/100267/cpu-(central-processing-unit)-by-ivak-100267)]

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