COMP3046
Group Assignment

Student Name	Student ID	Contribution	Percentage
Fong Ming To	19220456	the design, implementation, debugging, experiments, documentation	50%
Juai Sze Ming	19220502	the design, implementation, debugging, documentation	50%
			Total: 100%

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Design of the solution

- Using OpenMP
  - easier to program and debug
  - directives can be added incrementally - gradual parallelization
  - can still run the program as a serial code
  - serial code statements usually don't need modification
  - code is easier to understand and more easily maintained

Optimize the performance

OpenMP provides a transplantable and scalable programming model on a shared memory platform and to offer a simple and flexible programming interface for the development of parallel applications. It supports incremental parallelization so it is very easy to transform a serial application to a parallel one and gain considerable performance enhancement on shared memory architecture.

In our project, "feedforward" and "updateWeight" function need immense data processing. Thus, we adopt OpenMP to forks a team of threads to execute the following structured block. Furthermore, with the parallel for the directive, the system parallelism the for the loop by dividing the iterations of the loop among the threads.

Compile the source codes

1. Choose Start, expand All Programs(Win7 version only), and then expand Microsoft Visual Studio.
2. Depending on the version of Visual Studio you've installed, choose Visual Studio Tools, Visual Studio Developer Command Prompt.
3. Enter "cd ../directory" to redirect to the location of neuron network .cpp file
4. Enter "cl file.cpp" commend to compile neuron network .cpp file
5. Enter "file.exe" to execute the program.

Hardware environment

- Intel(R) Core(TM)i7-4770 CPU @ 3.40 GHz

Results

	Case 1 File : train_small.txt	Case2 File : test.txt	Case3 File : train.txt
Runtime(without OpenMP)	3881ms	35855ms	601745ms
Runtime(with OpenMP)	2027ms	15936ms	345672ms
Speed Up	1.91465219536	2.249937249	1.74079763475