# FIT3143 Tutorial Week 3

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## SAMPLE SOLUTION

1. Discuss advantages and disadvantages of Threads.

   Advantages:

   - Cheaper to create in resources.
   - Can simplify programming.
   - Context switching between threads is much faster than context switching between processes.

   Disadvantages:

   - Difficulty of writing code/debugging.
   - Difficulty of managing concurrency.
   - Difficulty of porting existing code.

2. OpenMP provides a temporary view of the thread memory. Discuss.

   All OpenMP threads have access to a place to store and to retrieve variables, called the memory. In addition, each thread is allowed to have its own temporary view of the memory. The temporary view of memory for each thread is not a required part of the OpenMP memory model, but can represent any kind of intervening structure, such as machine registers, cache, or other local storage, between the thread and the memory. The temporary view of memory allows the thread to cache variables and thereby to avoid going to memory for every reference to a variable. Each thread also has access to another type of memory that must not be accessed by other threads, called threadprivate memory.

   https://www.openmp.org/spec-html/5.0/openmpsu9.html

3. Explain why multiple nested parallel loops might be a bad idea in the fork-join model employed by OpenMP.

   Each fork has to create a team of threads, likewise each join has to synchronise and destroy the team of threads. Each fork and join operation will have some non-zero overhead, so parallelising each portion of a nested loop may result in more overhead than speed-up.