Introduction to OpenMP - Exercises

0.1 Hello World!

No programming course would be complete without this one! Write a code that:

- Says hello from each thread
- Uses the integer run time library routine `omp_get_thread_num()` to output the thread's unique number.
- Uses the appropriate data sharing.

Run on different numbers of threads.

0.2 Matrix Multiply

In the matrix.f90 and matrix.c files you will find code to compute a matrix multiplication. You should parallelise the one in your preferred language.

0.3 How many threads?

Write a code that adds up the number of threads, WITHOUT using a run time library call. Have only the master thread print the result. Hint: use reduction.

0.4 Dot product

Write a parallel OpenMP code to compute the dot product of two real vectors, a and b, of length n:

$$\sum_{i=1}^{n} a_i b_i.$$

Try to do it without a `reduction` clause and gathering the sum into a shared variable. Do you get the same result?

Try to perform timing on your code.

0.5 Data Dependency

In the depend.f90 and depend.c files you will find code that involves a data dependance. You should parallelise the one in your preferred language.

Consider carefully about where the `parallel` directive should be.