Parallelization with OpenMP: the Mandelbrot set

Download the mandelbrot.zip file from DTU Learn and unzip the sources. There is a C and a Fortran version - choose whatever suits you.

Exercise 1:

1. Choose the setup for the compiler you use, i.e. either Studio ('use_studio'), GCC ('use_gcc') or GNU Fotrtan ('use_gnu').
2. Generate the serial version by using 'make'. If the build process fails, try to do a 'make realclean' before you do 'make'. Run the executable and check the output in the mandelbrot.png file.
3. Parallelize the generation of the Mandelbrot set using OpenMP worksharing constructs. Check the runtimes for different numbers of threads. Note: Dumping the image to the disk takes a fixed time, independent of the number of threads. You can comment the call to the image writer in the code, to avoid this.
4. Does your code scale? How can you check this?
5. What do you have to change to make the code scale?
6. Create a version of the code that uses orphaning. What is the advantage (or disadvantage) of using orphaning here?