1. Consider a function $f(x) = sin(x)$ in the interval $[0, \pi]$.
   1. Write either a CUDA or an OpenCL codes to numerically integrate the function using the

      (a) Trapezoidal Rule

      (b) Montecarlo Method

   The choice of CUDA or OpenCL depends on the graphics card you have access to

2. Perform a convergence study, using different numbers of divisions (or sampling points), by comparing the integral obtained the numerical method with the analytical integral.

3. Report the average time taken by the accelerated code.

4. Write a MPI code for the above problem as well. (No GPUs involved here)

5. Perform a timing study using 2,4,6 and 8 MPI processes.