The goal of this assignment is as follows:
- Getting familiar with OpenMP

**Problem 1.** Write a program that relies on OpenMP-enabled parallel programming to evaluate the integral

\[
I = \int_{0}^{100} e^{\sin x} \cos \left( \frac{x}{40} \right) dx
\]

Note that the value provided by MATLAB for this integral is \( I = 32.121040688226245 \). To approximate the value of \( I \) use the following extended Simpson’s rule:

\[
\int_{0}^{100} f(x)dx \approx \frac{h}{48} \left[ 17f(x_0) + 59f(x_1) + 43f(x_2) + 49f(x_3) + 48 \sum_{i=1}^{n-4} f(x_i) + 49f(x_{n-3}) + 43f(x_{n-2}) + 59f(x_{n-1}) + 17f(x_n) \right]
\]

In the approximation above, \( x_0 = 0 \), \( x_n = 100 \), \( h = 10^{-4} \), and \( n = \frac{100}{h} = 10^6 \). This value of \( n \) goes to say that you divide the interval \([0, 100]\) in \(10^6\) subintervals when evaluating \( I \).

After implementing the code, you will have to run the code on Euler using
- One computational thread (sequential execution)
- Using OpenMP on either an Intel (up to 8 physical and 16 virtual cores) or AMD (up to 64 cores) per box. Try to squeeze as much performance as possible out of the available hardware.


**Mercurial** submitted work should include:

- Your source code ready to be compiled and run by the TA
- A report that includes a summary of the timing results