Exercises: Python Extensions

Part A

Using the “Pi by Quadrature” example from “Concurrency and Parallelism” (or any other small problem that interests you that has a component that is performance critical) write Python extensions for just the performance critical section – in the case of the “Pi by Quadrature” code it is the “tight loop” performing the sum for a given slice.

You should write a number of versions of the extension:

1. C++ or C code using `ctypes`
2. C++ or C code using the Python API directly
3. Using SWIG
4. Using Cython

Given a pure Python version to act as the base, you should compare and contrast (roughly, no full blown experiment is needed for this exercise even though proper profiling and experimentation would be used for a “real world” problem) to see which of the extension solutions provides best performance at least effort.