Thread Safety

Computational Science II (CAAM 520)

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Rice University, Spring 2021

Motivating example

Let us compute an approximation to π using a Monte Carlo method:

Generate random points in $[0,1]^2$ and count the points inside the quarter circle given by

$$\sqrt{x^2 + y^2} \leq 1.$$

Then

$$\frac{\pi}{4} \approx \frac{\#(\text{points inside quarter circle})}{\#(\text{points})}.$$

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→ No, because `rand()` is not ***thread safe***!

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→ Consult its documentation.

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Back to our example: Why is `rand()` not thread safe?

Thread safety

Note: In general, a thread safe function may still result in

- poor performance, or
- deadlocks

when called concurrently.