Lehrstuhl für Computergestützte Modellierung und Simulation
TUM School of Engineering and Design
Technical University of Munich

Professional Software Engineering

Lecture 9: Exercises

Exercise 1 Performance Comparison - Parallel and Serial

Numerically compute the value of π using the following methods and compare their performance. Use 1×10^6 and 1×10^9 iterations for your comparison.

1. Serial LINQ
2. Parallel LINQ
3. Serial for loop
4. Parallel for loop

Note: The following formula can be used to estimate the value of π.

$$\frac{1}{n_{steps}} \sum_{i=1}^{n_{steps}} \frac{4}{1 + (\frac{i+0.5}{n_{steps}})^2} \tag{1}$$

Exercise 2 The Dining Philosopher's Problem

Implement the Dining Philosopher's problem `https://en.wikipedia.org/wiki/Dining_philosophers_problem` in C#.

Note: Make sure your code is *lock-safe* using the Monitor class.

Once you are done, try to create a *deadlock* in your program.