Parallel Programming

Instructor

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4 pm – 5 pm, Mondays

Course Overview

Parallel Programming (Teams Code: 302kib9)

We are going to learn the basics of asynchronous programming, creating multiple threads and processes in this course. Python is preferred as the programming language for the applications of this course.

Required Text

Python Concurrency with asyncio, Manning, *Matthew Fowler*

A Practical Approach to High-Performance Computing, Springer, *Sergei Kurgalin – Sergei Borzunov*

Python Parallel Programming Cookbook, Packt, *Giancarlo Zaccone*

Course Materials

- Python 3.x (Anaconda is preferred)
- Jupyter Notebook from Anaconda
- Pycharm from JetBrains / Microsoft Visual Studio Code
- PC with a Linux distro or a Linux terminal in Windows 10/11.

Course Schedule

Week	Subject	Week	Subject
01	Data Structures in Python	08	Deadlock and Semaphore
02	Functions and Decorators in Python	09	Barriers and Conditions
03	Coroutines and Concurrency with asyncio	10	Creating Processes with multiprocessing
04	IO-bound Problems and Concurrency	11	Pipes and Queues
05	Creating Threads in Python with threading	12	CPU-bound Problems and Parallelism
06	Global Interpreter Lock and JIT Compiler	13	Creating Clusters
07	Protecting Resources with Lock	14	Load Balancing with Containers