HPC / Scientific Computing Starter Schedule (30 Days)

WEEK 1 — C++ & Numerical Basics
Day 1: Set up C++ environment, compile simple programs
Day 2: Learn vectors, arrays, loops, functions
Day 3: Numerical derivatives + finite difference basics
Day 4: Implement 1D grid + update rules
Day 5: Build basic heat equation solver (no parallelism)
Day 6: Plot output in Python (matplotlib)
Day 7: Cleanup + GitHub push

WEEK 2 — OpenMP + Performance
Day 8: Learn OpenMP basics (parallel for)
Day 9: Add OpenMP to solver
Day 10: Benchmark before/after
Day 11: Add stability condition checks
Day 12: Improve memory layout
Day 13: README + documentation
Day 14: Finalize project

WEEK 3 — Python HPC Layer
Day 15: Learn Numba (JIT)
Day 16: Accelerate a Python version of solver
Day 17: Benchmark CPU vs Numba
Day 18: Add convergence tests
Day 19: Build comparison plots
Day 20: Create second GitHub repo
Day 21: Rest / review

WEEK 4 — Preparation for CUDA / MPI
Day 22: Learn basics of GPU architecture
Day 23: Learn CUDA syntax
Day 24: Write a simple CUDA kernel (vector add)
Day 25: Try porting one loop from solver
Day 26: Benchmark GPU vs CPU
Day 27: Cleanup + documentation
Day 28: Update resume with new skills
Day 29: Create portfolio structure
Day 30: Final review + next-step planning