WEEK TWELVE

Acknowledgements: Slides created based off material provided by Dr. Michael Raymer and Dr. Travis Doom

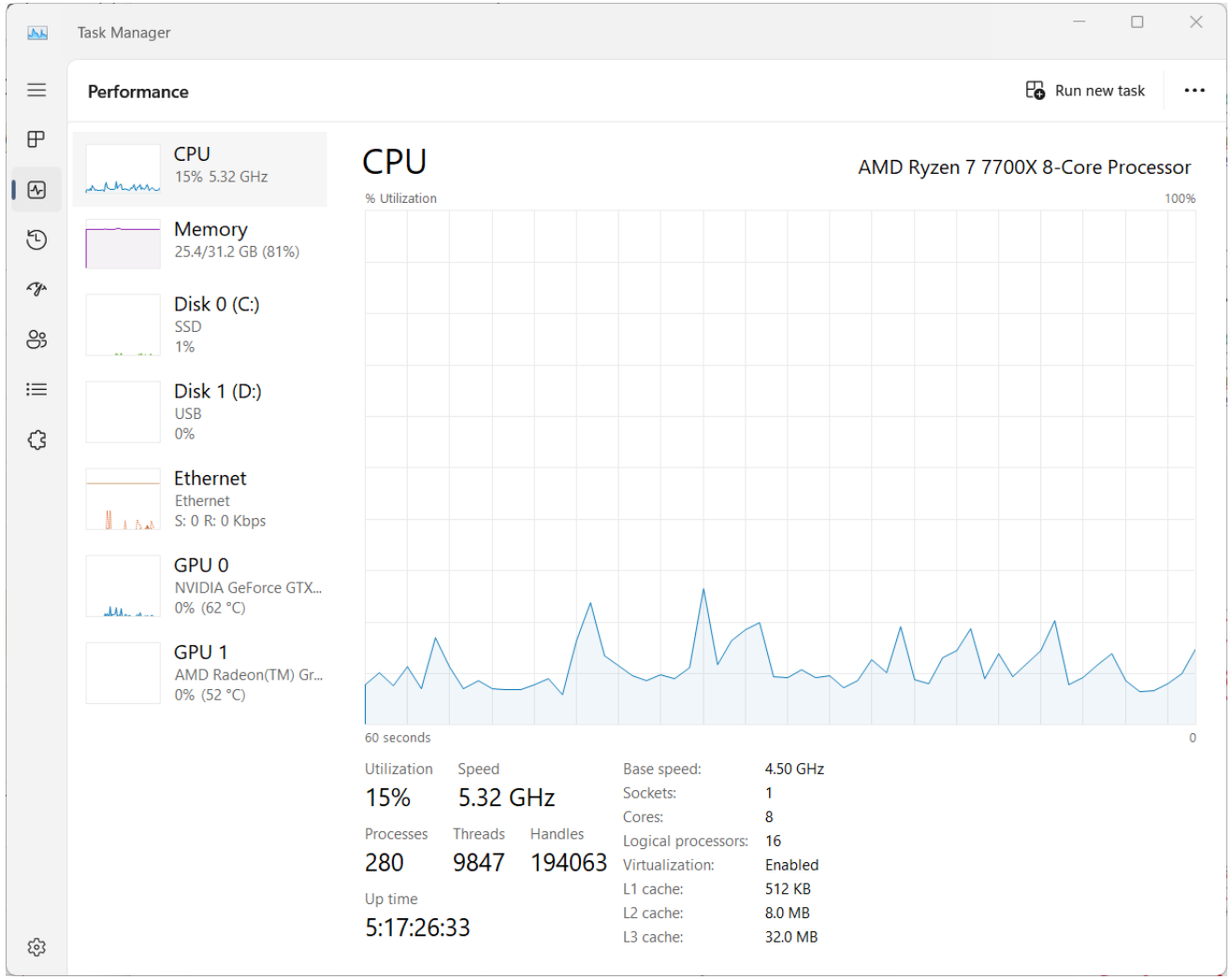
HOW DO COMPUTERS RUN MANY PROGRAMS AT THE SAME TIME?

Multiple cores

Pre-emptive multitasking

EXECUTION CORES

- Task manager shows number of cores on your CPU



PROCESSES

- A process consists of:
  - Memory Space
    - Heap
    - Stack
    - Globals/Statics
    - Code
  - Program State
    - Program counter
    - Execution state: Running, waiting, sleeping, etc.

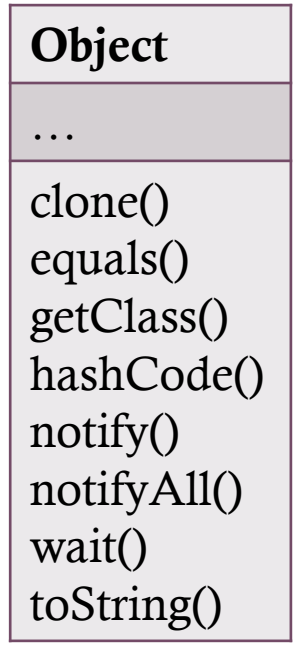
Each program executes as a single process.

THREADS

- An execution thread (aka a lightweight process) is a sequence of instructions being executed
- Threads share memory space but have their own stack frames
- A process can have multiple threads
- So far, we've only seen one or two execution threads running at a time

THREADS IN JAVA

- Concurrency and threads are a core part of the java language (no import required!)



CLASS THREAD