**Week 1: Storage Systems**

**Overview**

The memory hierarchy is model for the time required to access data in processor registers, processor caches, RAM, disk, and over a network (see figure below from *Computer Systems: A Programmer's Perspective*, 3rd edition). Each of these levels generally has an order of magnitude or more difference in latency.  When analyzing in-memory data structures, we don't generally differentiate between RAM and processor cache.  The cost of reading and writing data to disk is so large, however, that we do need to consider it in our design.

A diagram of a memory structure

AI-generated content may be incorrect.

**Reflection Questions**

* Why are reads and writes organized into pages?
* What are some of the differences between rotating disks and SSDs?
* What is meant by locality? Why is locality important?
* What is read throughput?
* What is the memory mountain?
* Why is caching important?