



CIS 3990 Recitation 04

Locality & IO

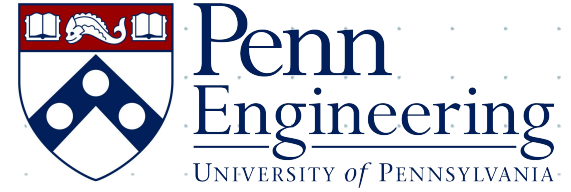
2025-09-25

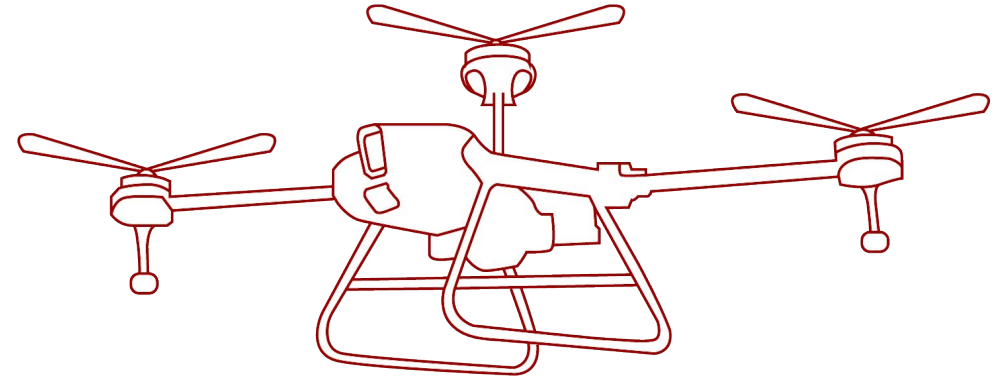
Agenda

01 Logistics

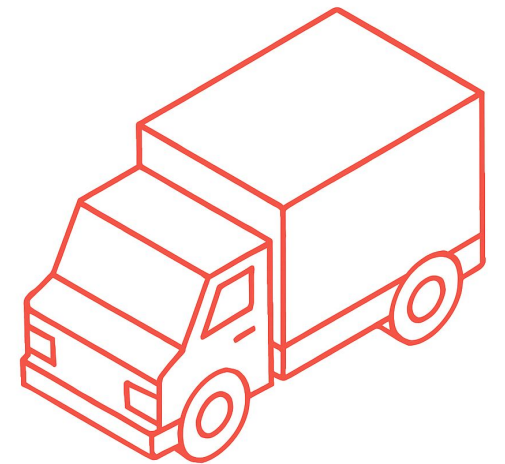
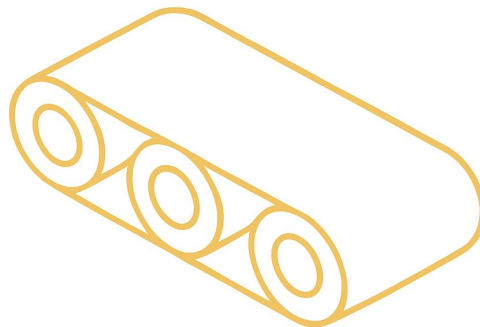
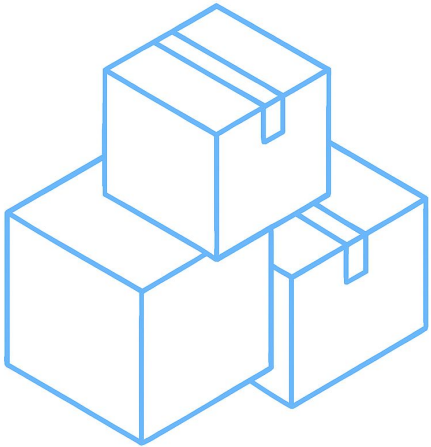
02 IO manipulation

03 Locality





Logistics



Logistics

- HW04 out - due 11:59pm on Tues, Sep 30 - via Gradescope
- HW03 out - due TONIGHT, Sep 25 - via Gradescope
- Check-in should be out - can be used to reopen any one of the HW00 - HW03
- HW01 and HW02 graded for style - feel free to reopen, fix, and resubmit if you're unhappy with the grade



Input & Output

Performance & Manipulation



Buffers?

- Whenever our program has to interact with other parts of the computer - files on disk, command line interface, etc. - it has to make a system call, which takes time
- Therefore, to mitigate the number of system calls, we try to pack as much data as reasonably possible in every system call:
 - Read more data from a file in advance
 - Wait for data to accumulate before writing

Benefits and drawbacks



Drawbacks - lecture

Benefits - now

Benefits and drawbacks

Drawbacks - lecture

- It looks like code did not execute - requires flushing

Benefits - now

Benefits and drawbacks

Drawbacks - lecture

- It looks like code did not execute - requires flushing
- Object-related overhead

Benefits - now

Benefits and drawbacks

Drawbacks - lecture

- It looks like code did not execute - requires flushing
- Object-related overhead

Benefits - now

- Performance - demo

Performance Demo

```
• [moya@5ad86bf379f8 rec_04] - (main) % tree
.
|-- Makefile
|-- baseline.cpp
|-- beemovie.txt
|-- buffered_read_char.cpp
|-- buffered_read_line.cpp
|-- buffered_write.cpp
|-- buffered_write_flushed.cpp
|-- manipulation.cpp
|-- shrek.txt
|-- unbuffered_read.cpp
`-- unbuffered_write.cpp
```

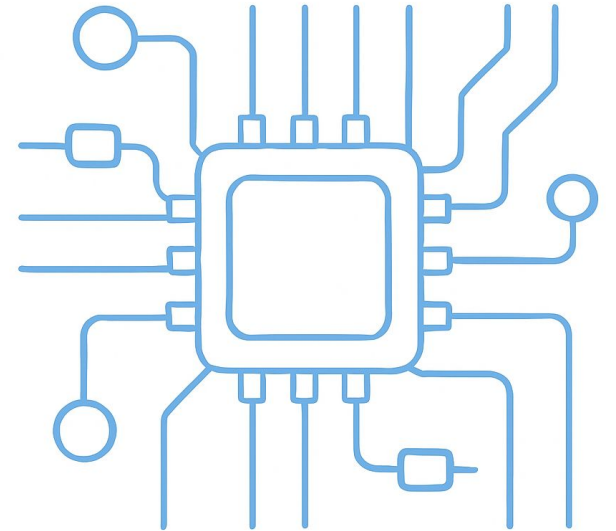
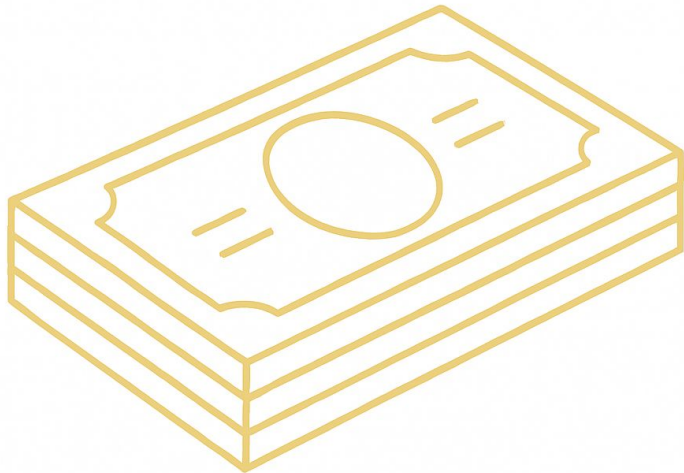
IO Manipulation

- Another advantage of streams is the availability of convenient output modifiers
- Most are part of either
 - **<iomanip>** (manual include)
 - **<ios>** (automatically included when including **<iostream>**)

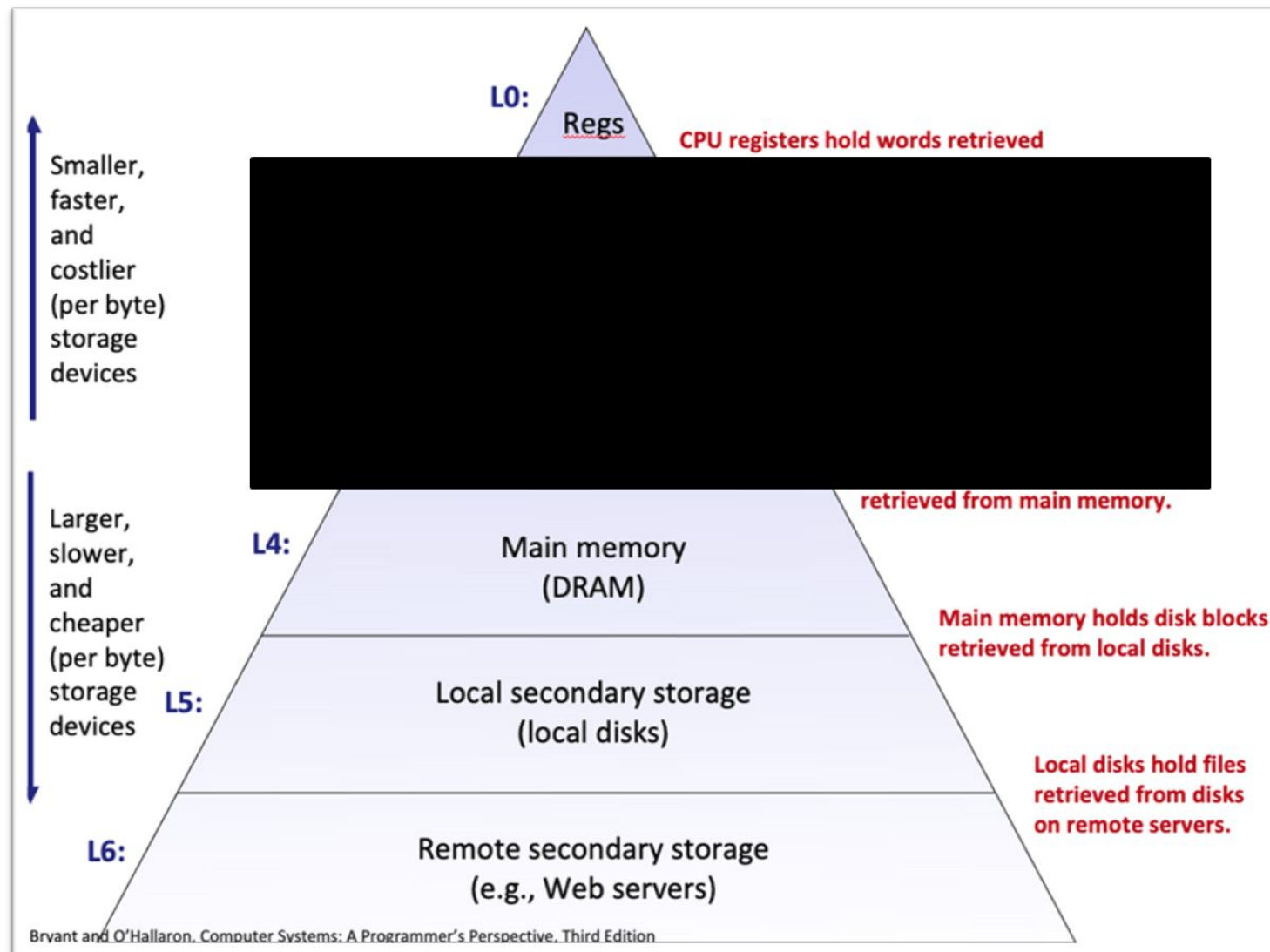
IO Manipulation & Demo

- Allows for modification of:
 - Numerical base
 - Precision for floating point numbers
 - Output format
 - Field width
 - Whitespace fill character
 - Alignment
- Most of the flags are sticky, some are not though

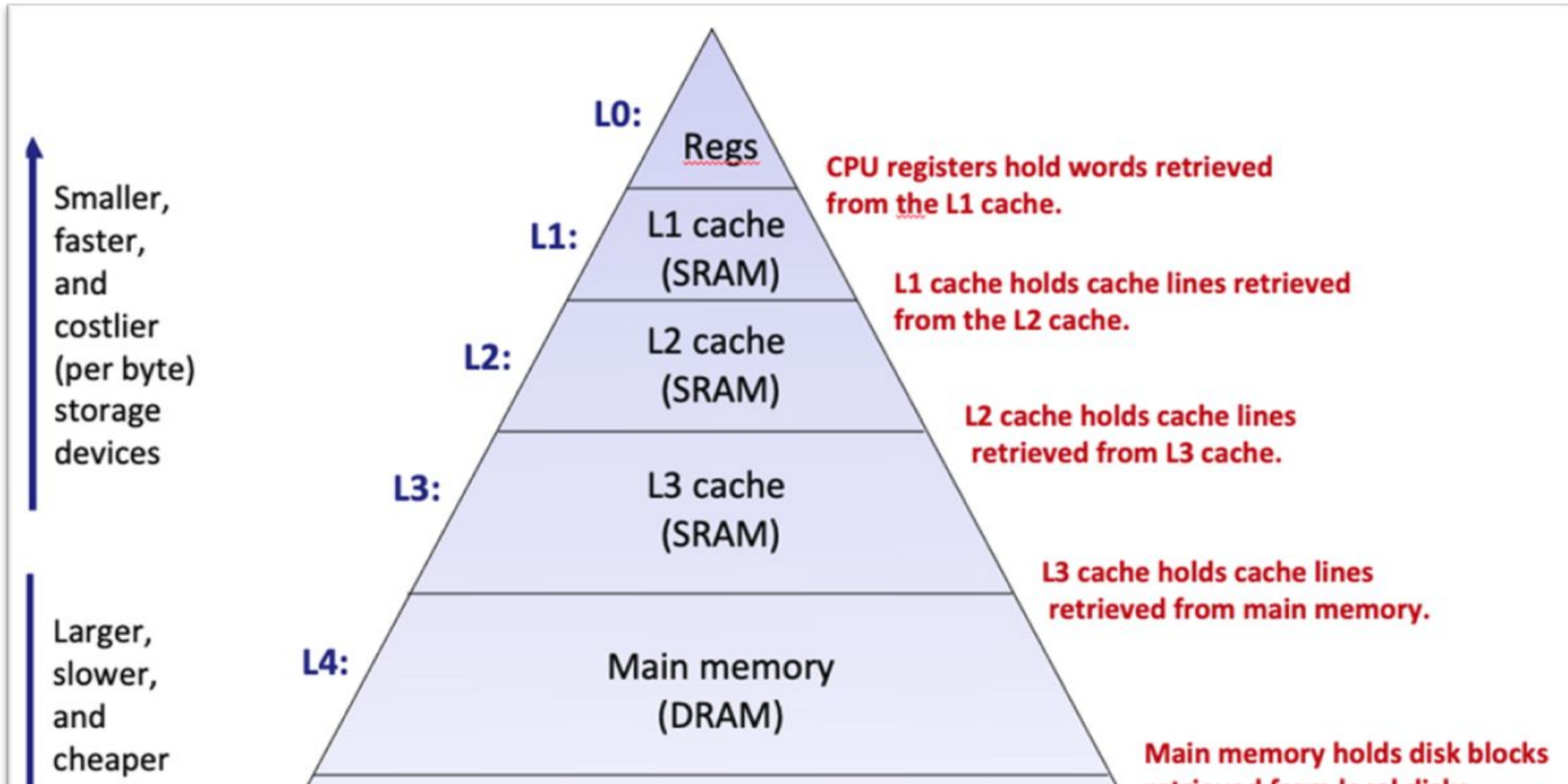
Caches



Travis hid them from you



Red pill



Chalk, talk, demo



comparchviz.com



That's all Folks!