

CSCI 210: Computer Architecture

Lecture 38: Last Class!

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Slides from Cynthia Taylor

Announcements

- Cache Lab (final project)
- Course Evals!
 - Extra credit for 90% response rate
 - Currently at 59%
- Office Hours today 13:30-14:30
 - Zoom only

Lab 8: Cache Simulator

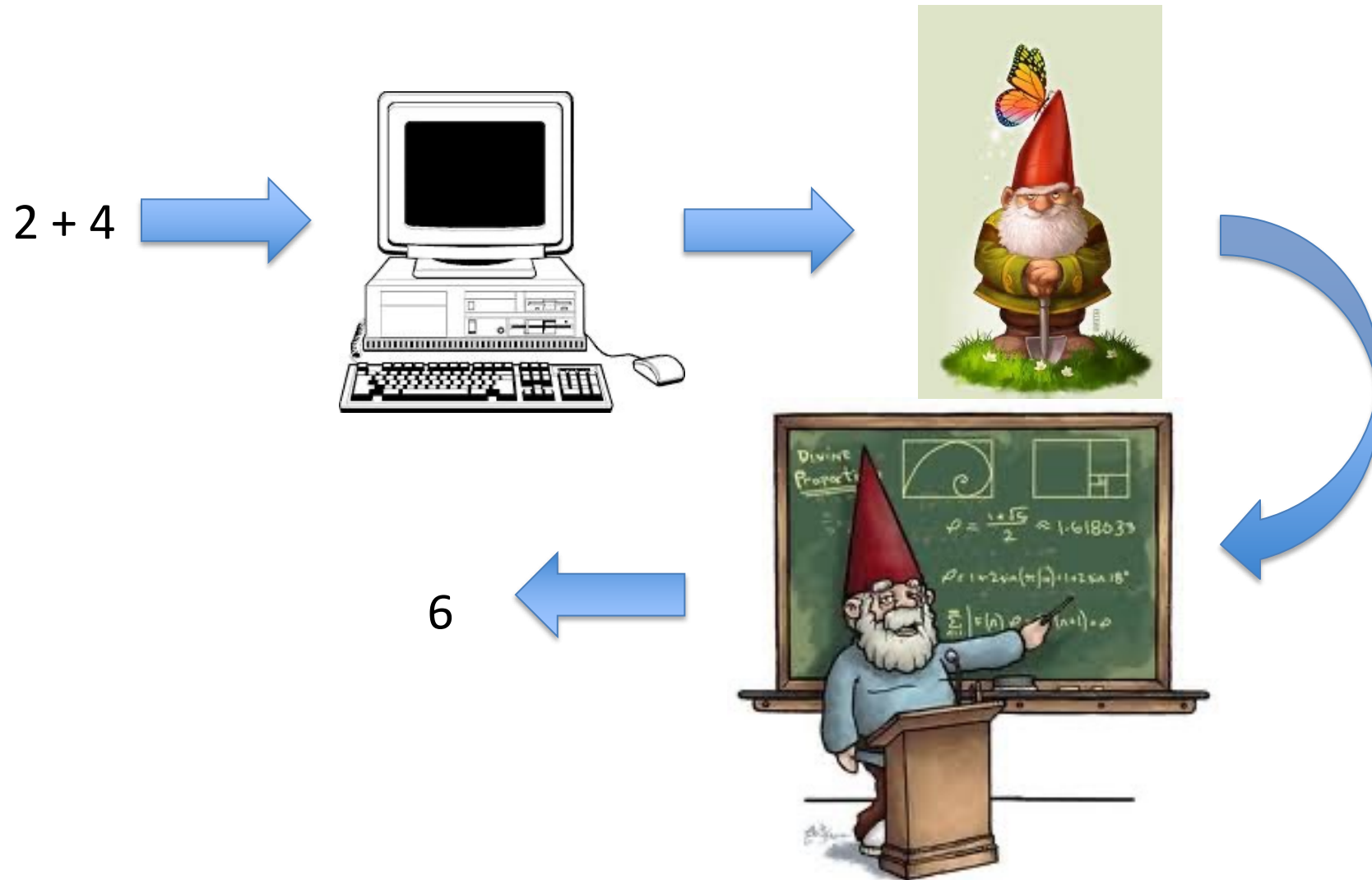
- Take in a trace of load/stores from a real program
- Simulate running the program on a given cache
- Calculate how well a given cache would perform for that trace

What do you need to do?

- Create data structures that emulate a cache
- For each instruction, find where it would go in the cache, check if it's already there
- Calculate number of miss penalty cycles, load misses, store misses, instructions, etc

Cache Questions?

Previous Conceptions of How Computers Work



Actually Assembly

High Level:

`x = 2 + 4`

Assembly (assuming we have a mem address for x in \$s0):

```
li    $t1, 2
```

```
addi  $t1, $t1, 4
```

```
sw    $t1, 0($s0)
```

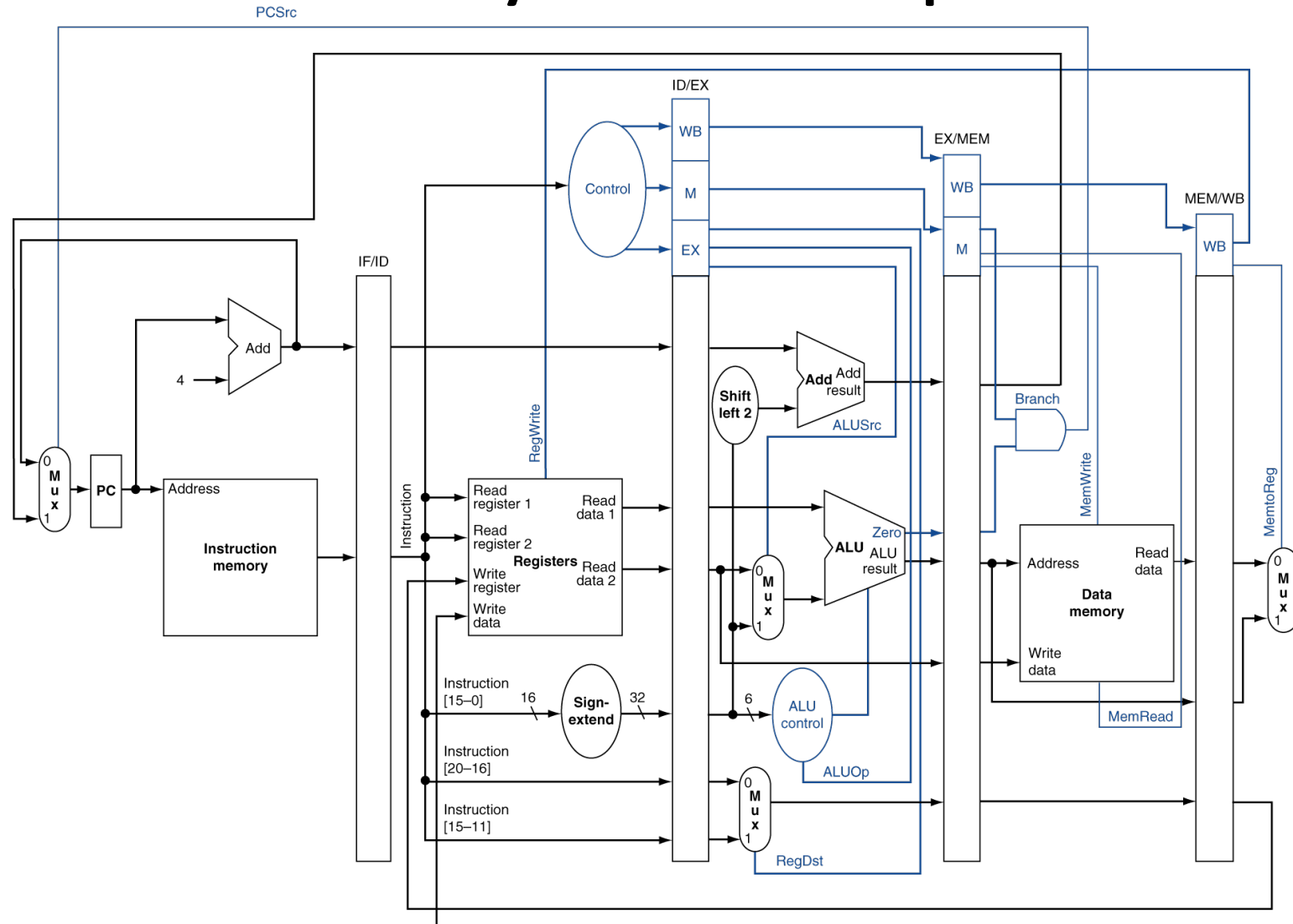
Actually Machine Instructions

```
addi $t1, $t1 5
```

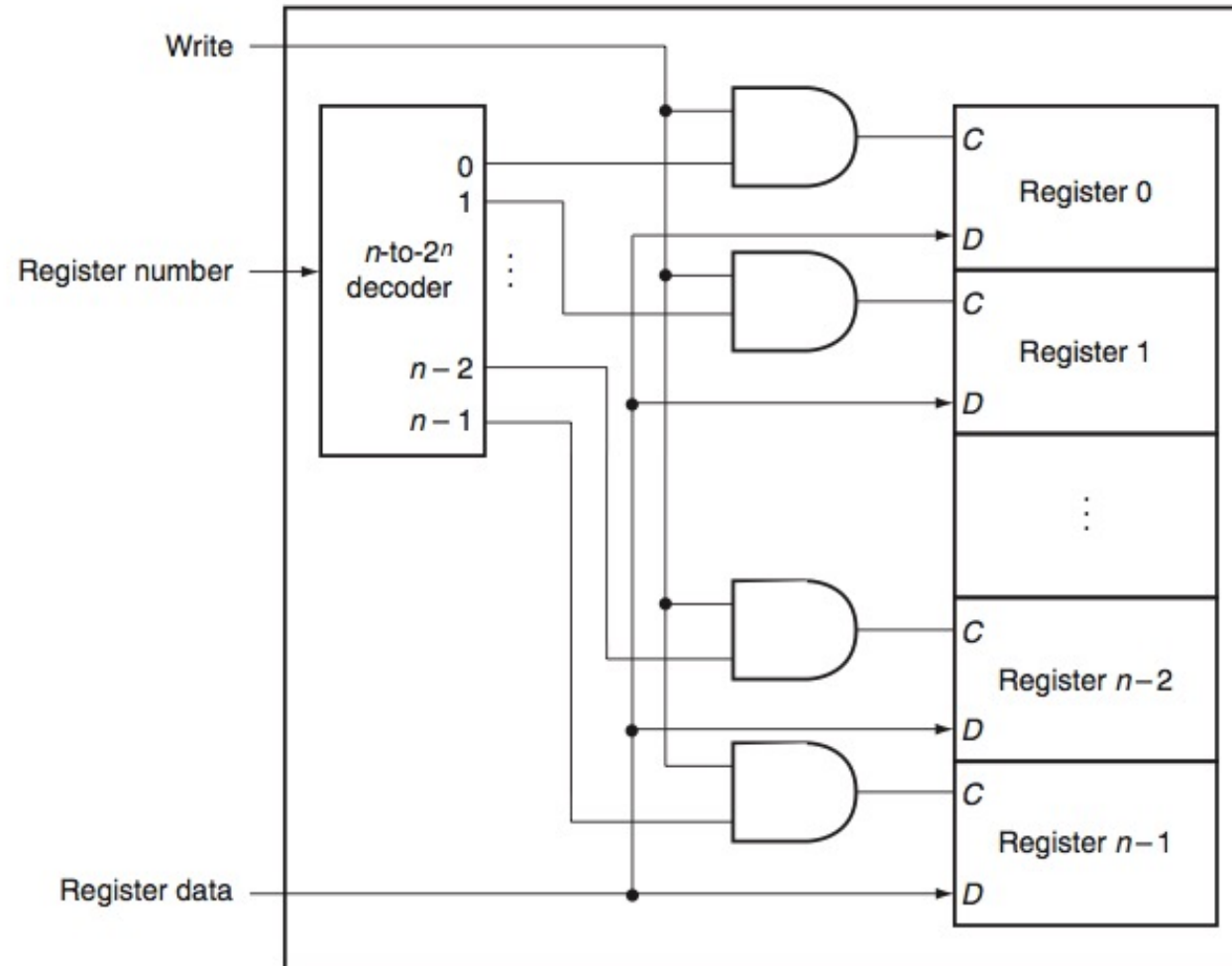


```
0010000100101001000000000000001001
```

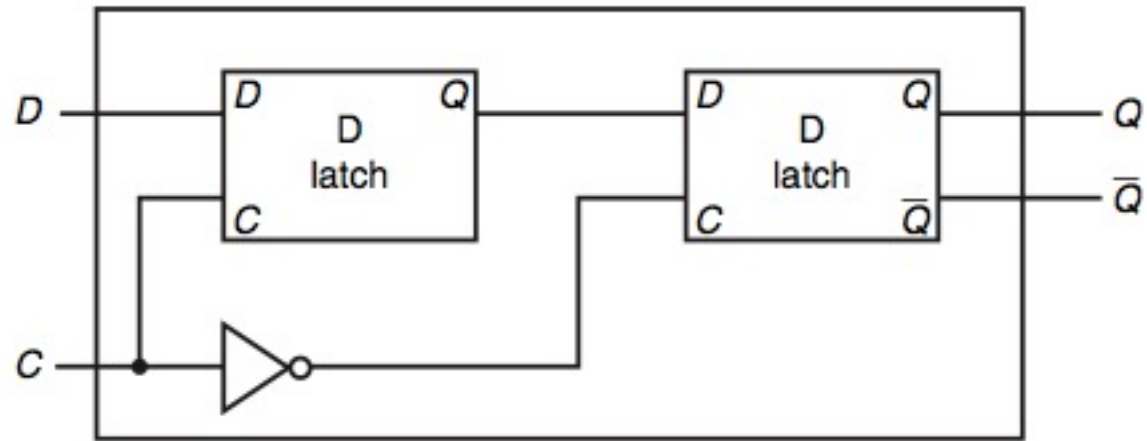

Actually The Datapath



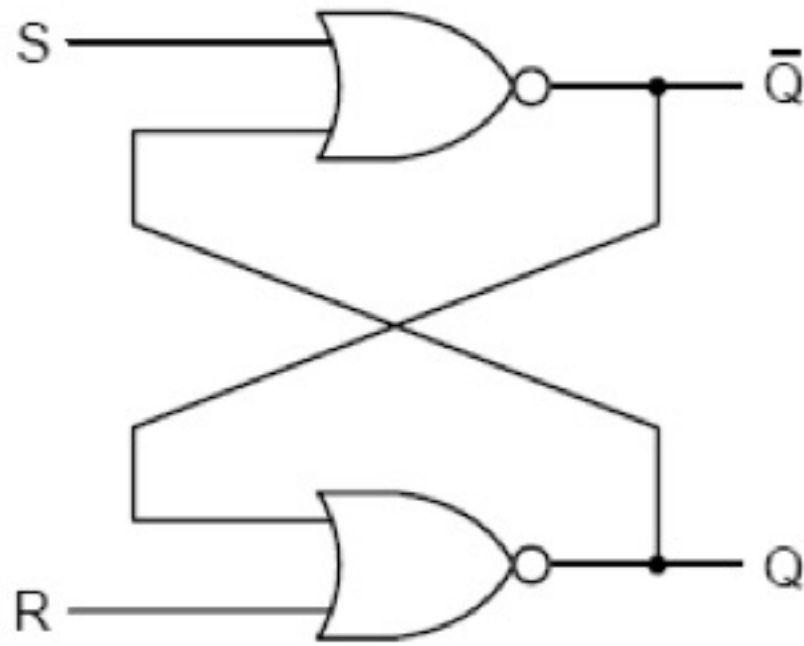
Actually Registers



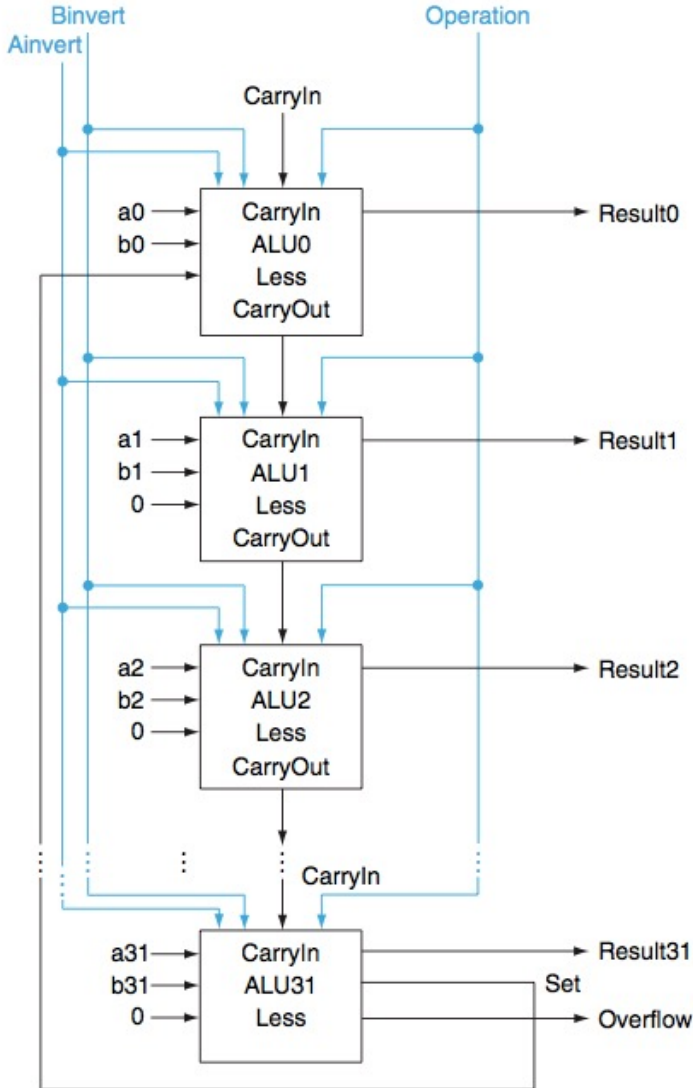
Actually Flip-flops



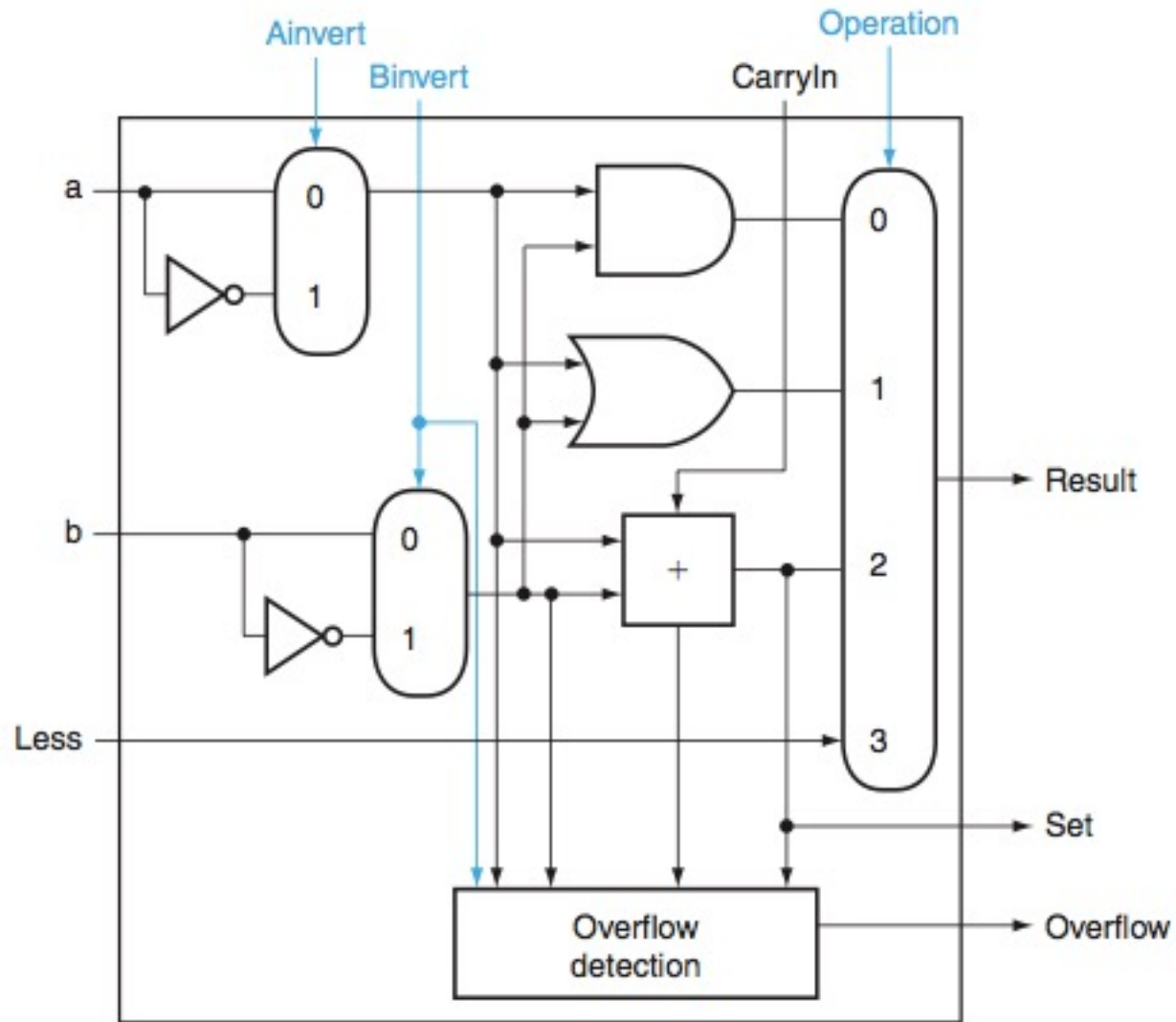
Actually Latches



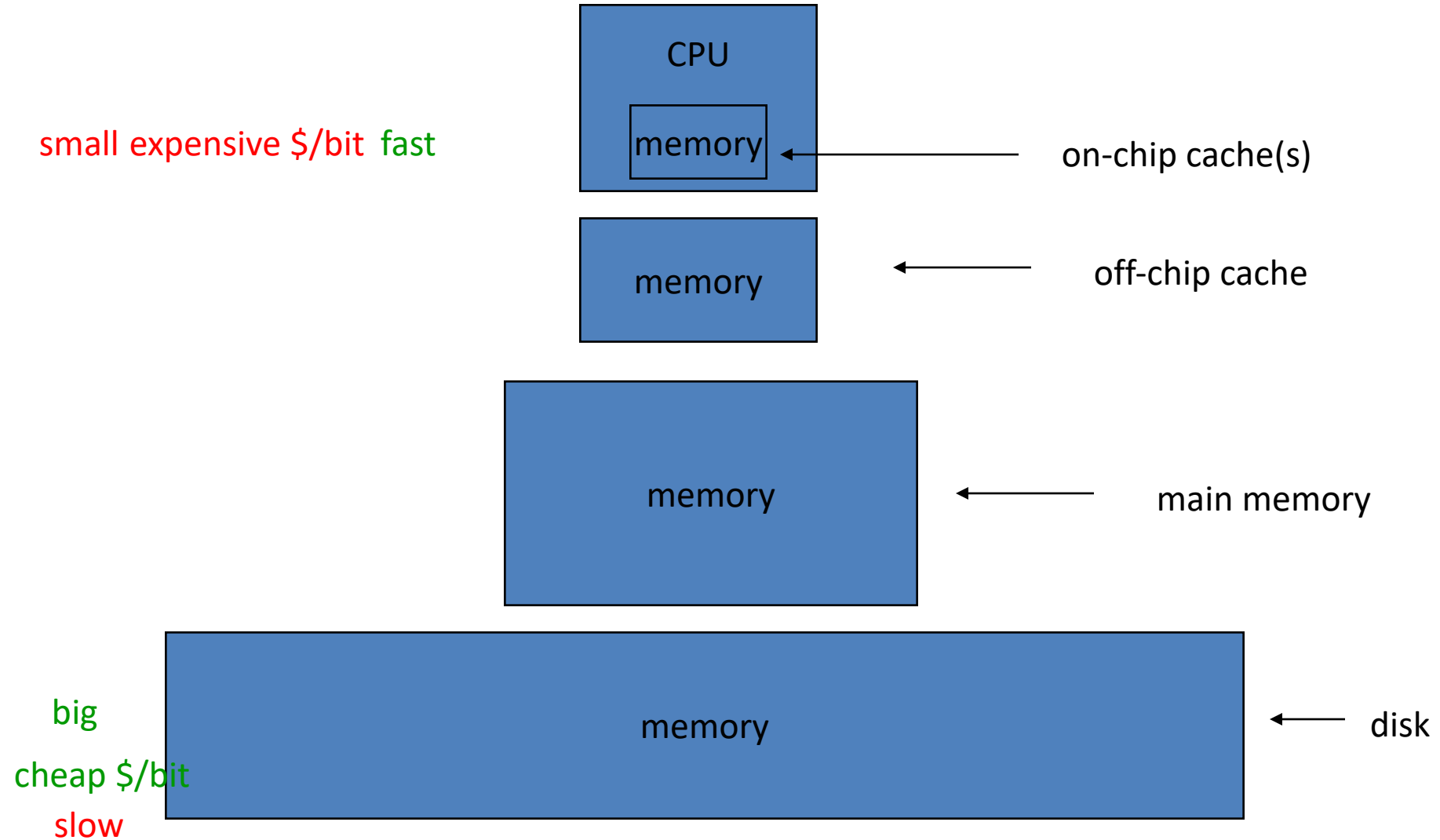
Actually the ALU



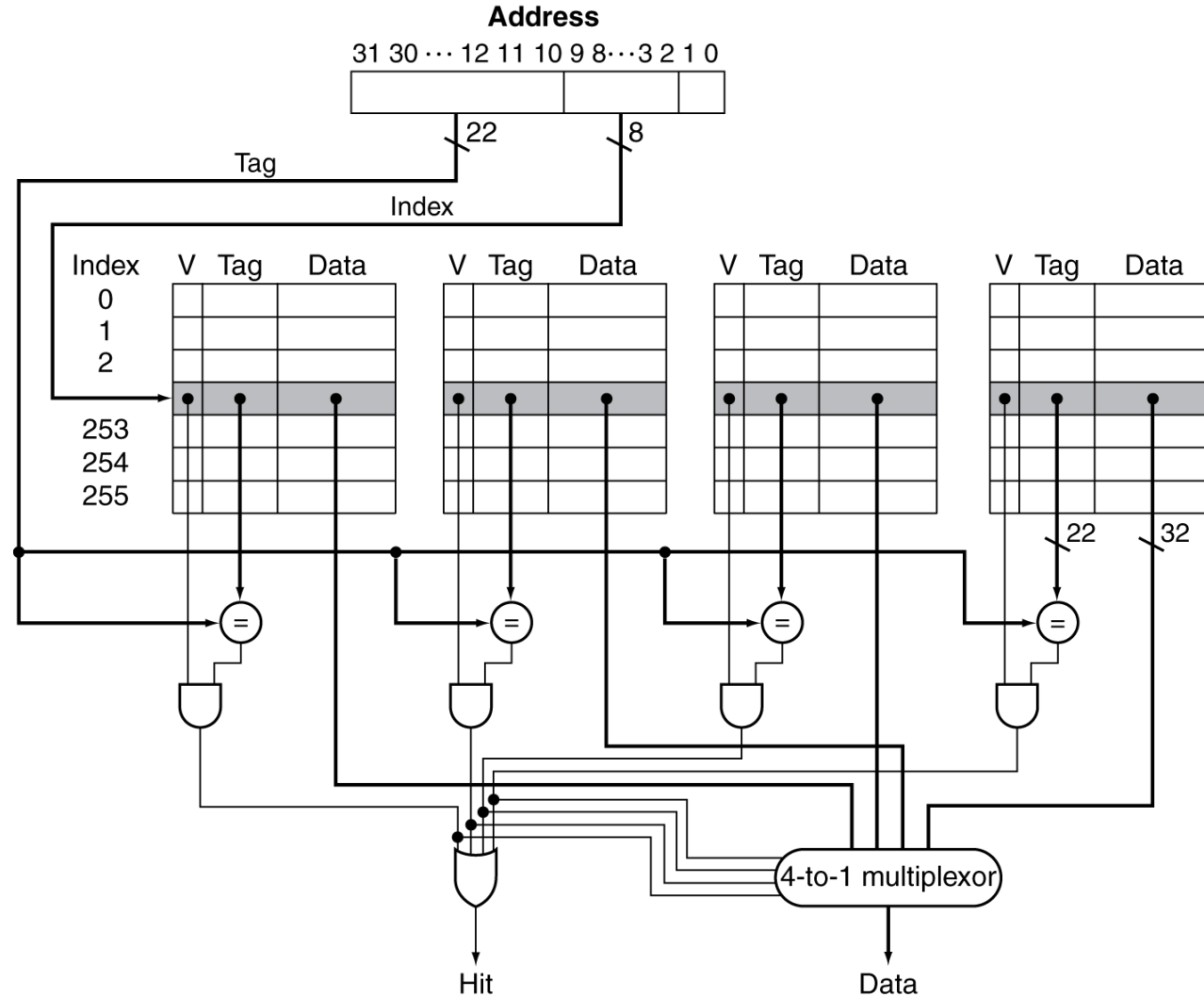
Actually the ALU



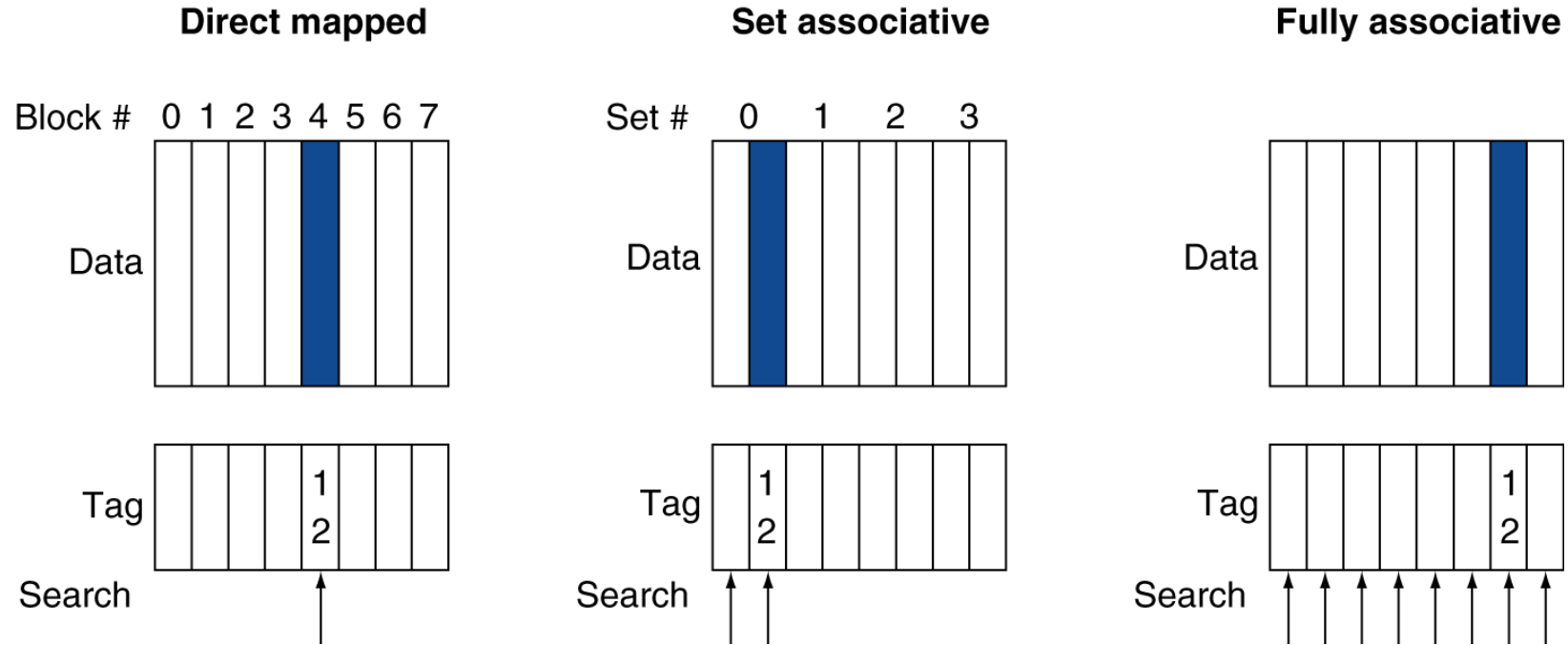
Actually Memory



Actually Caches



Actually LOTS of Caches



But wait, what about?

- Negative Numbers
- Floating Point
- All that other stuff . . .

Computers

are

Complicated

- But now, you know how they work. Kinda.

- I appreciate all the work you've done for this class.
- Have a great break!
- ...and fill out course evals!