Notes for 10/21/09

Cache associativity

Direct mapped
Same as 1-way set associative.

n-way set associative
Where *n* is number of blocks in a set. Number of sets is cache size divided by *n*. Each memory index now has *n* different ways to be stored in the cache.
Cache size = block size * number of sets * set size
For example, if 1-way has tag | set index | block offset bits = 18 | 9 | 5, then...
2-way: tag | set index | block offset bits = 19 | 8 | 5
4-way: tag | set index | block offset bits = 20 | 7 | 5

Fully associative
You have just one big set, and any memory index can be stored anywhere in the cache.
For example, with a 2 KB cache and 64-byte blocks, you would have 32 sets and thus 6 bits to index in cache. So bits for tagline | cache index | block offset are 26 | 0 | 6.