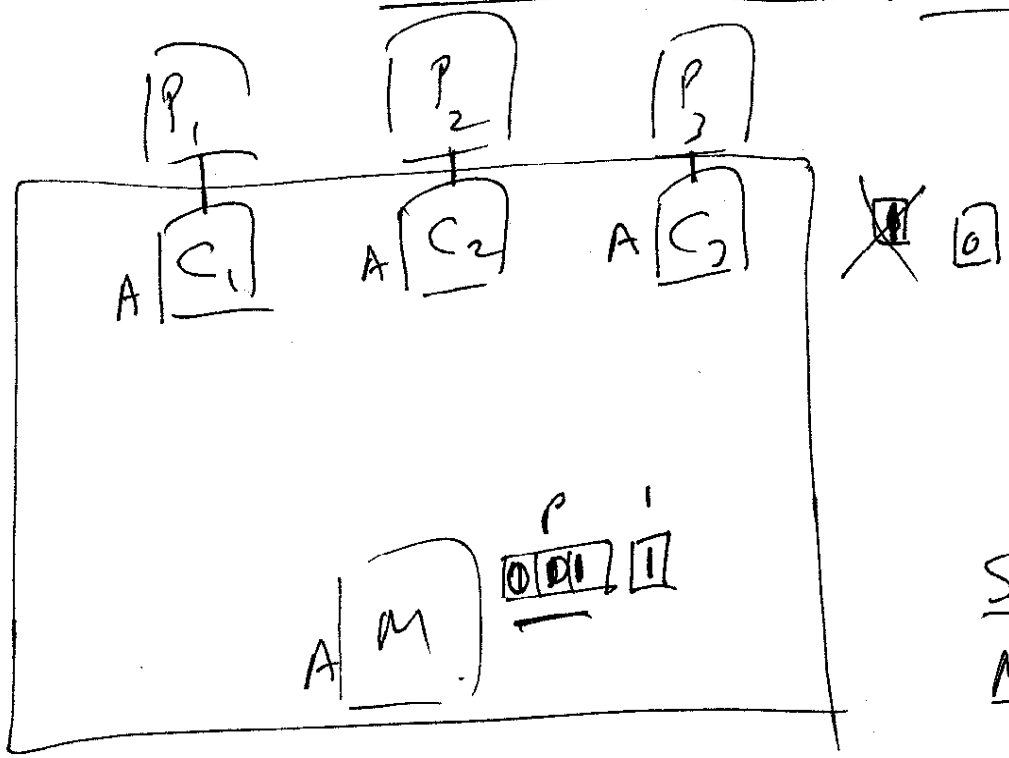
CACHE COHERENCE (DIRECTORY) C.C./1



Each cache line in memory has (P+1) bits

Each cache line in each Cache has (1) bit

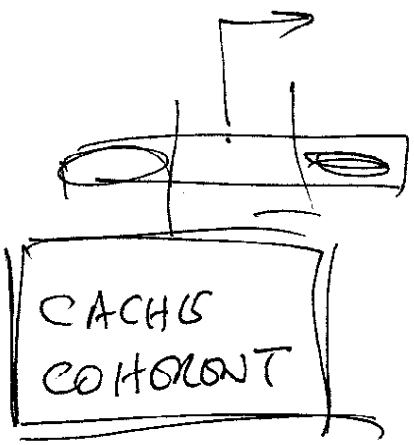
1 0 1

0 0 1

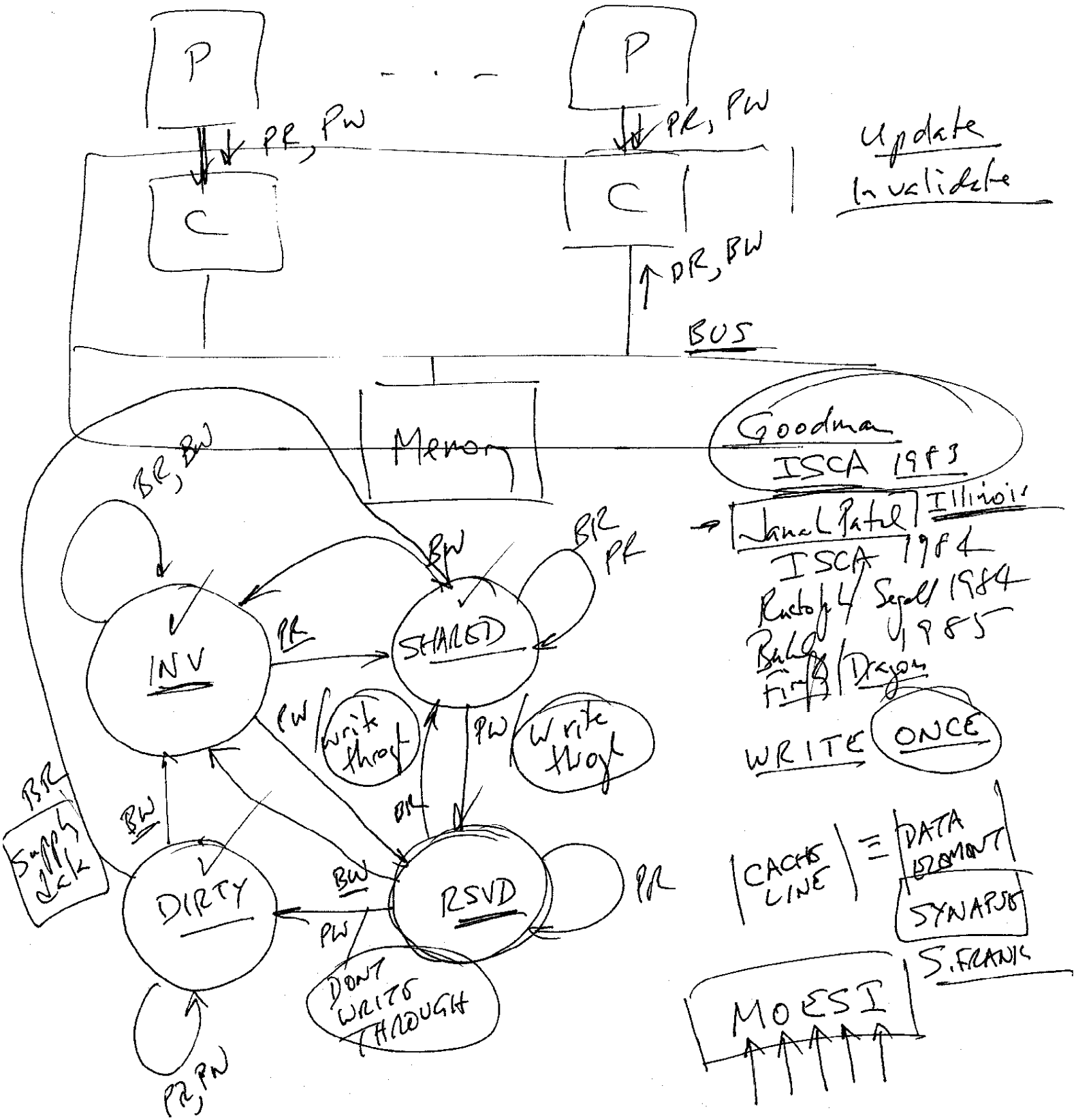
0 0 1

0 1 0

1 0 0



Cache Coherency
(Snoopy Cache)



MEMORY CONSISTENCY

CRITICAL SECTION

~~A:~~ $L1 = 0$ | $L2 = \phi$

A: $L1 = 1$
B: if $(L2 = \phi)$ { critical sect }

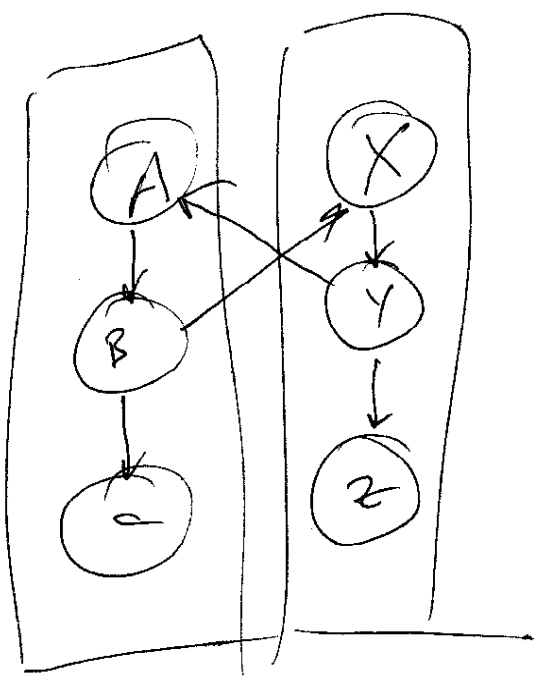
C: $L1 = \phi$

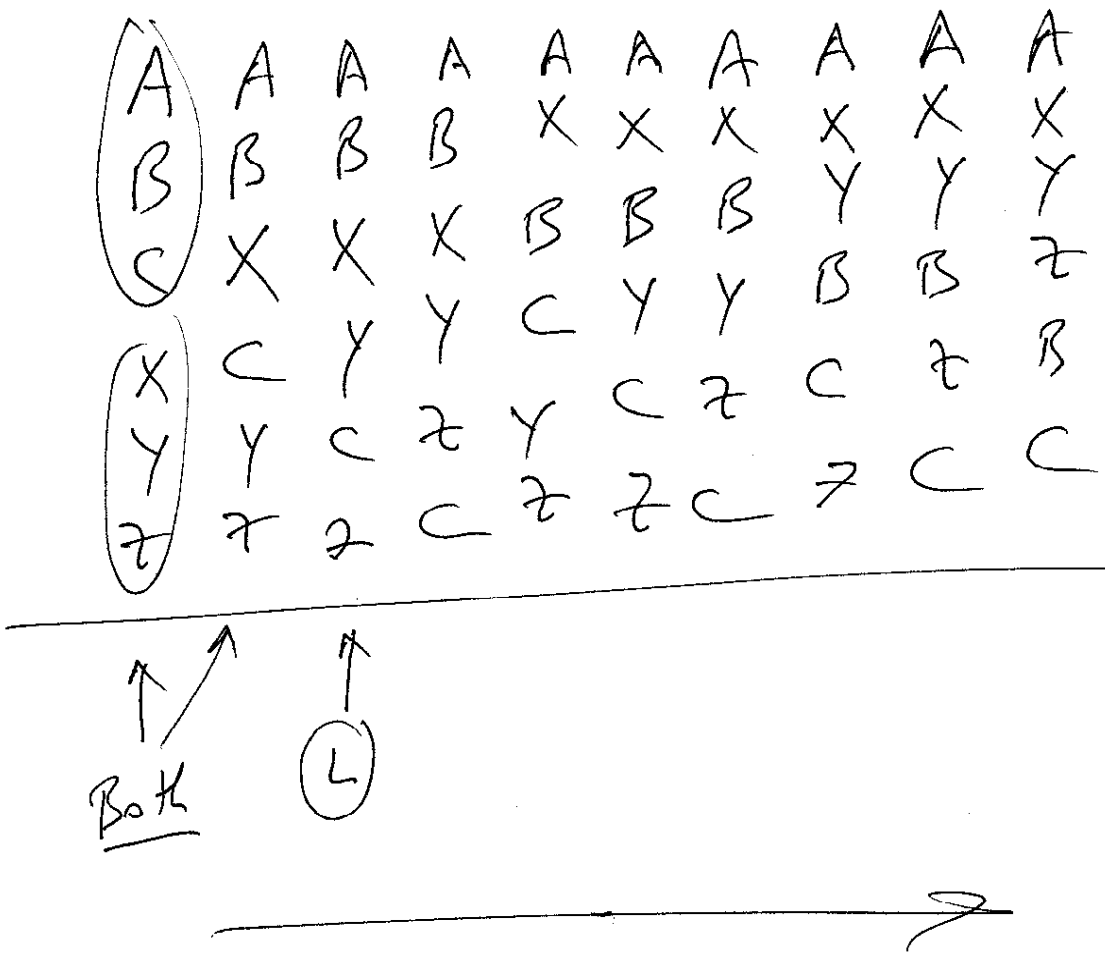
X: $L2 = 1$
Y: if $(L1 = \phi)$ { critical sect }

Z: $L2 = \phi$

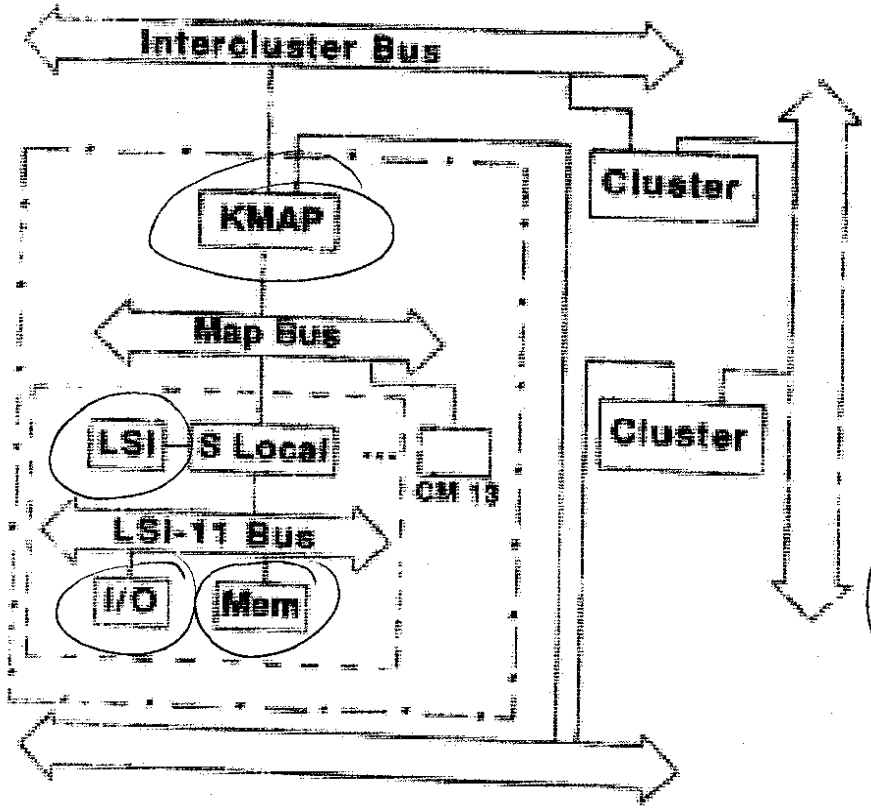
LESLIE LAMPORT ~1978

SEQUENTIAL CONSISTENCY




A
B
C
X
Y
Z
A A A A A A A A A
B B B X X X X X X
X X X B B B Y Y Y
C Y Y C Y Y B B Z
Y C Z Y C Z C Z B
Z Z C Z Z C Z C C
Both
L

cm*



CMU ~1978

DAN SIEWIOREK

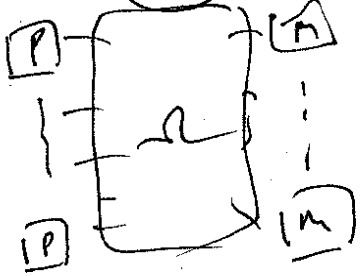
ANITA JONES

→ DISTRIBUTED SHARED MEMORY

Note: ***A well-meaning student told me to get rid of this slide. cm* is old. People will think you are an old man, and not take you seriously.***

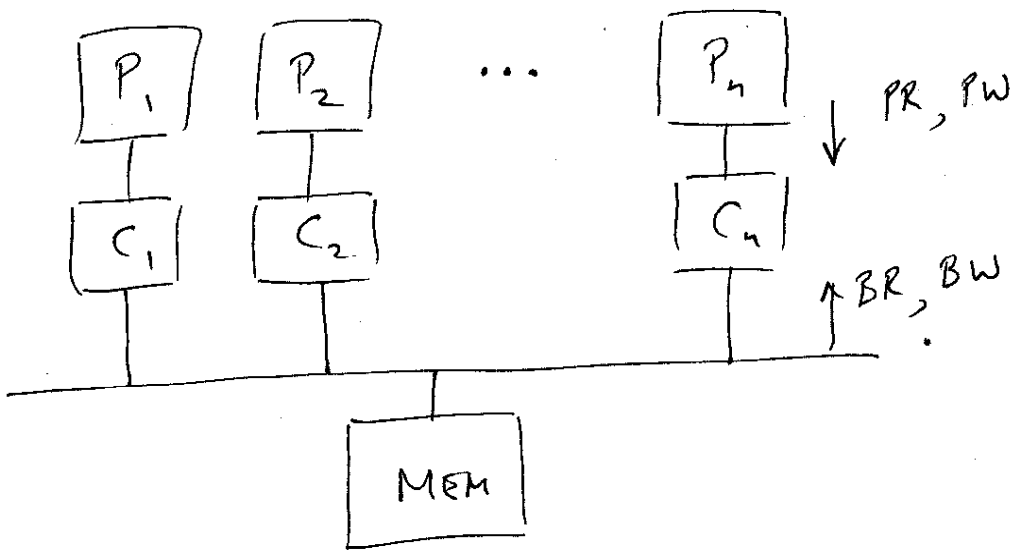
NUCA

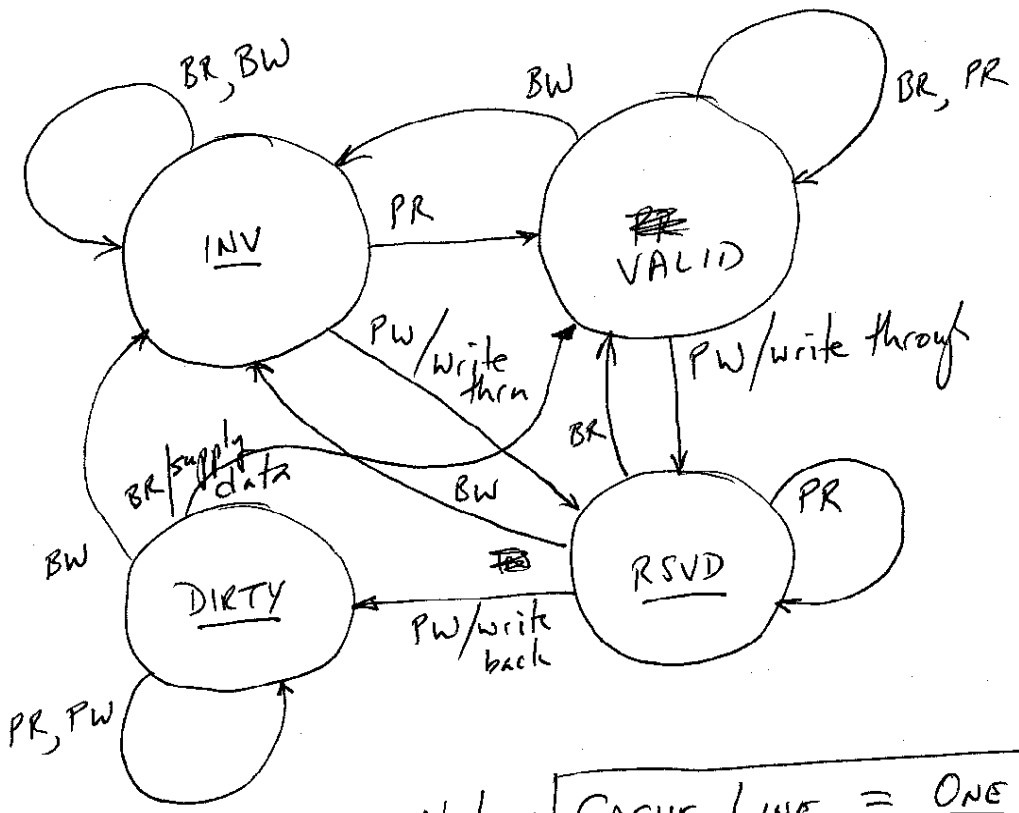
UCA



DSM

Snoopy Cache





Note: Cache Line = One Element

MESI / MOESI