Pulling Up and Pushing Down Data

Reading

Writing

core

Registers

L1

L2

L3

main memory

flash/hard disk
Where is the Database Buffer?

Diagram showing a hierarchy of memory levels:
- Flash/hard disk
- Main memory
- L3 hardware
- L2 hardware
- L1 hardware
- Registers
- Core
Where is the Database Buffer?

Diagram showing layers of hardware, registers, L1, L2, L3, main memory, and DB Buffer.
Temporal Locality

given:

sequence of address references $A_1, ..., A_n$

$p_1, p_2, p_4, p_7, p_{12}, p_{23}, p_3$
Temporal Locality

given:

sequence of address references A1, ..., An

small distance in time for same address (temporal locality)
Example, Temporal Locality:
Spatial Locality

given:

sequence of address references $A_1, ..., A_n$

small distance in time for similar address (spatial locality)
small distance in time for same address (temporal locality)
spatial locality := generalization of temporal locality!
Example, Spatial Locality:

$$d(P_i, P_j) = |i - j| \leq 3$$

Read Ahead -> Read Adjacent
locality discussion based on: