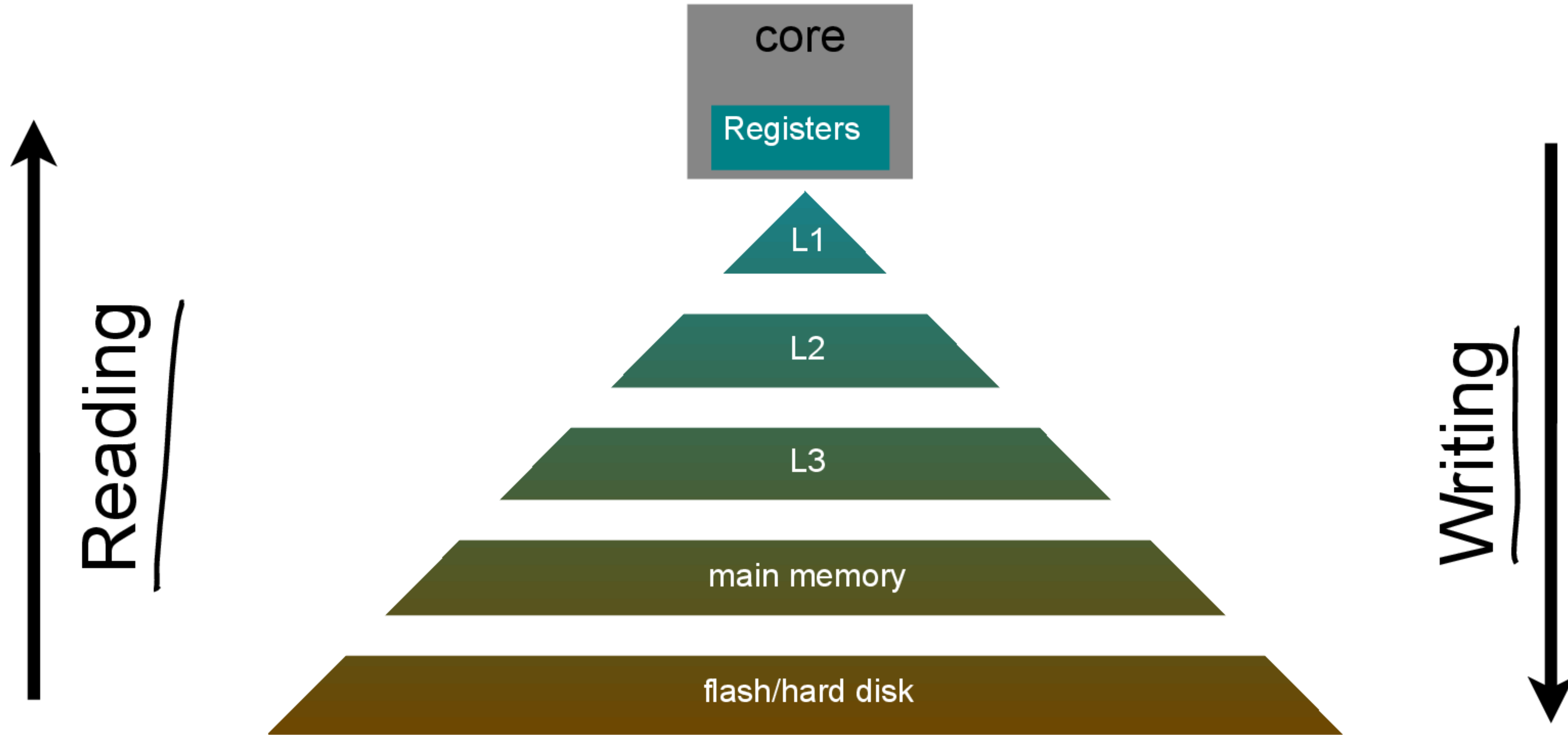
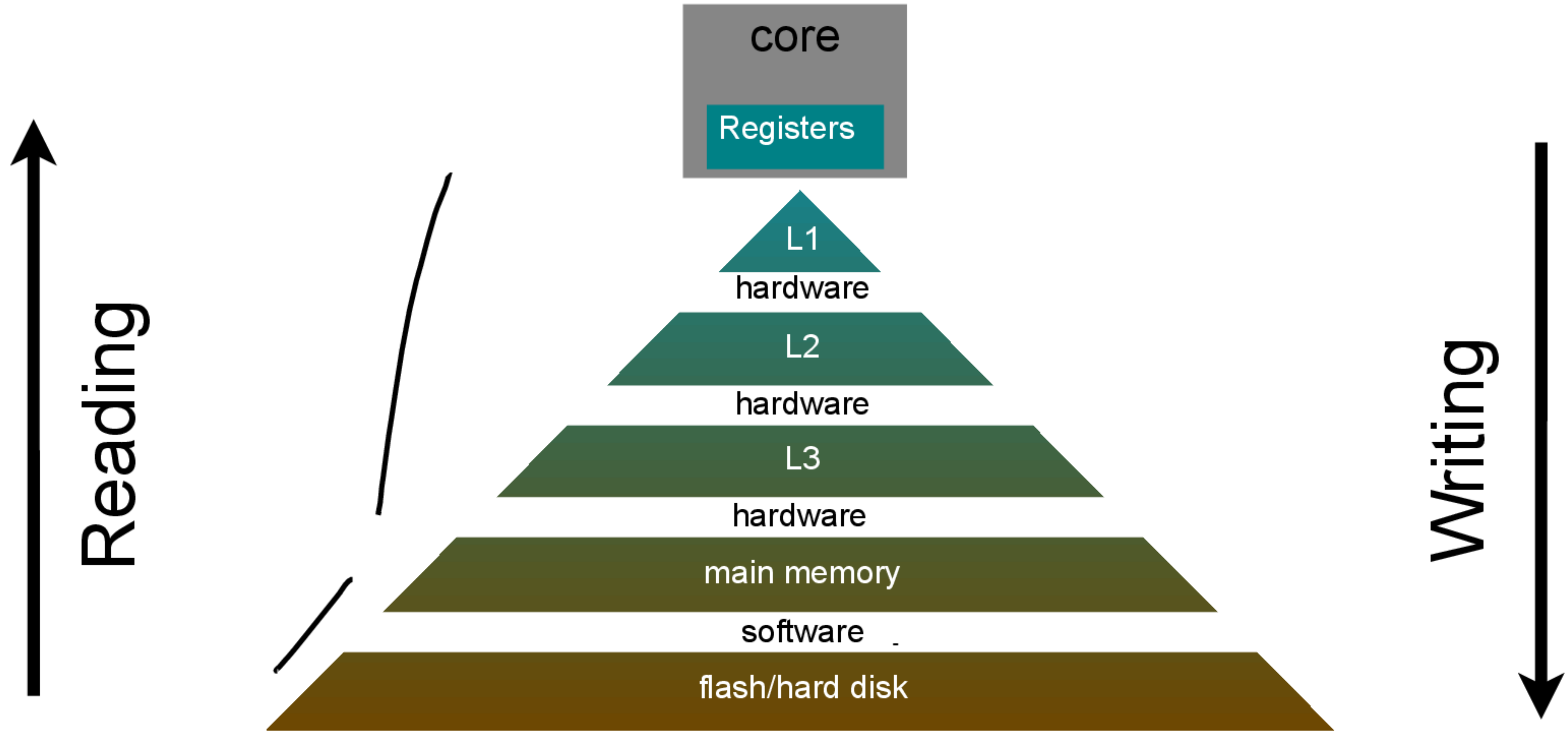


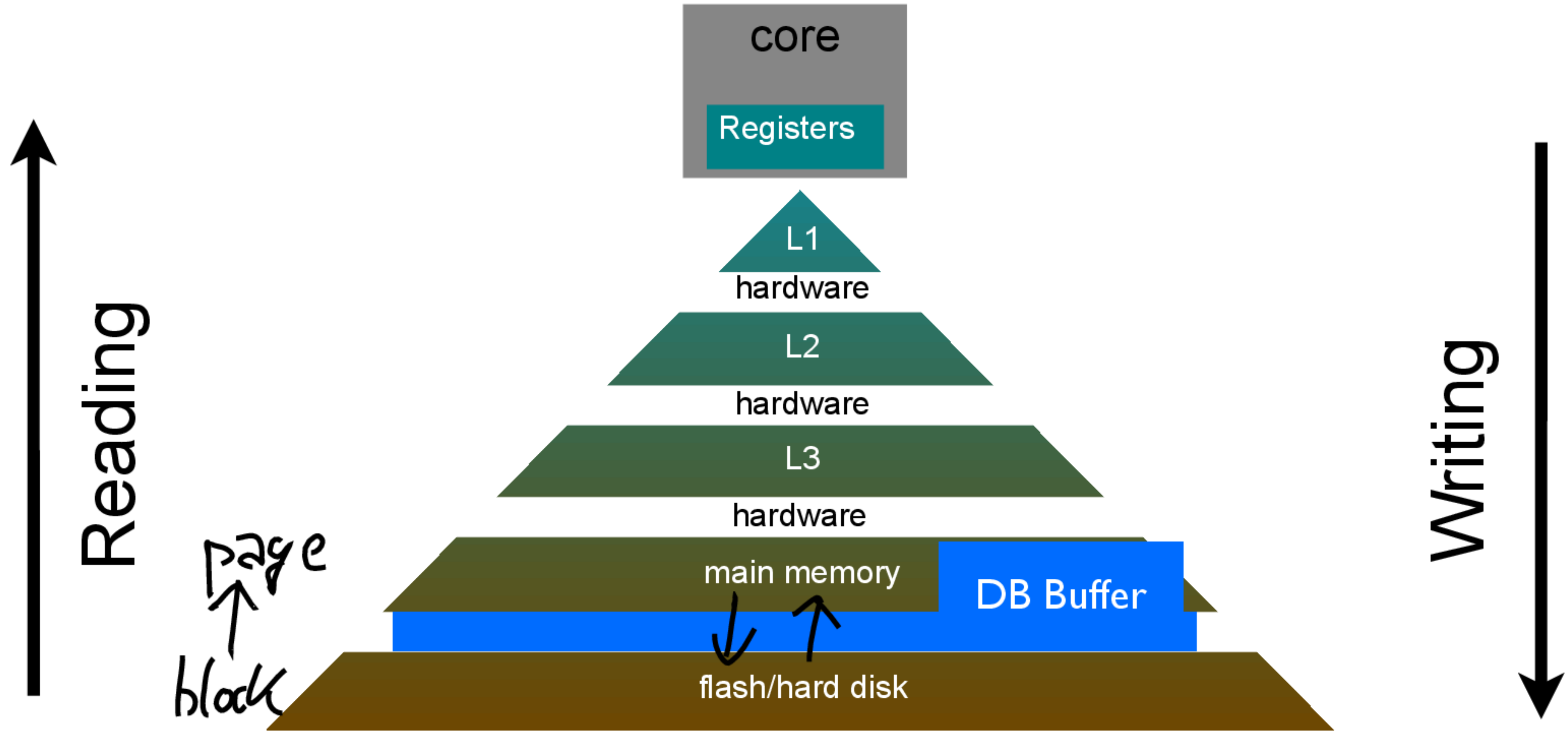
Pulling Up and Pushing Down Data



Where is the Database Buffer?



Where is the Database Buffer?



Temporal Locality

given:

sequence of address references A_1, \dots, A_n

$P_1, P_7, P_{42}, P_7, P_2$

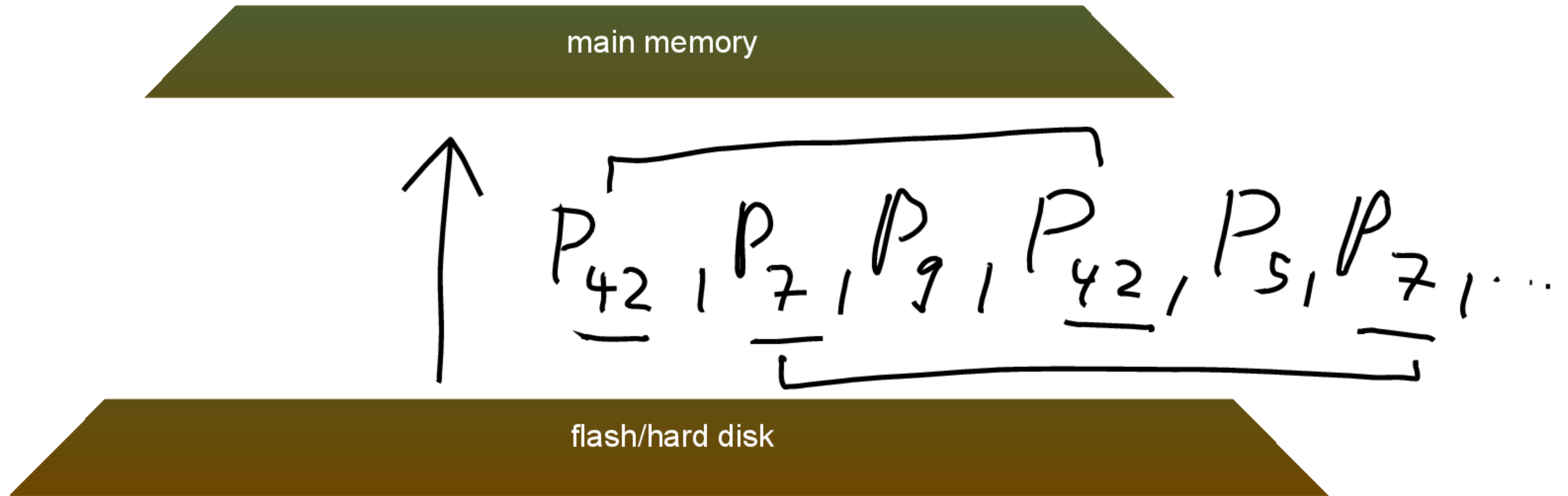
Temporal Locality

given:

sequence of address references A_1, \dots, A_n

small distance in **time** for **same address** (temporal locality)

Example, Temporal Locality:



Spatial Locality

given:

sequence of address references A_1, \dots, 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:

$R_1, R_2, R_7, R_7, \dots$

similar

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

P_7 R_1
 R_2

P_5, P_6, P_7, P_8, P_9

$P_{42}, P_7, P_9, P_{42}, P_5, P_7$

flash/hard disk

P_9

Read Ahead \rightarrow Read Ahead

Credits

locality discussion based on:

Saurabh Gupta, Ping Xiang, Yi Yang, Huiyang Zhou:
Locality principle revisited: A probability-based quantitative approach.
J. Parallel Distrib. Comput. 73(7): 1011-1027 (2013)