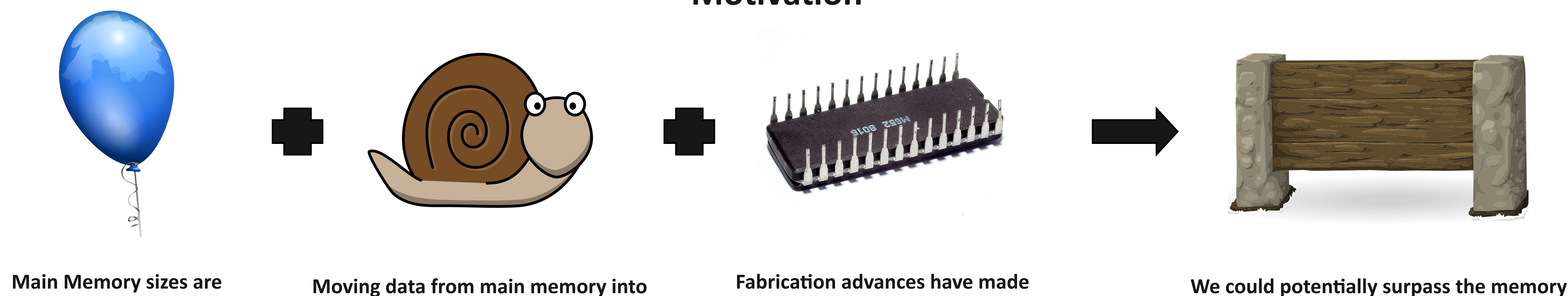
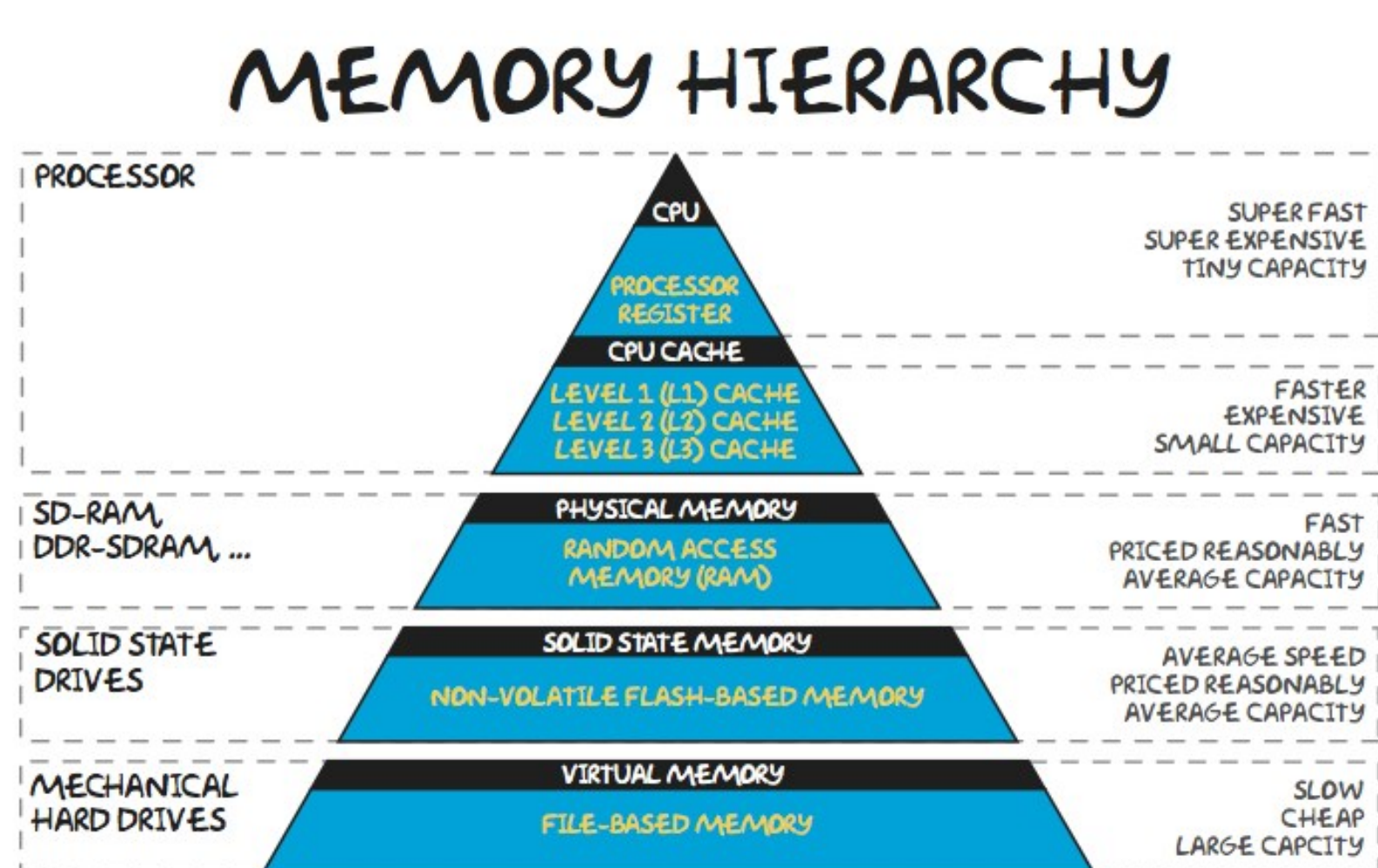




Motivation



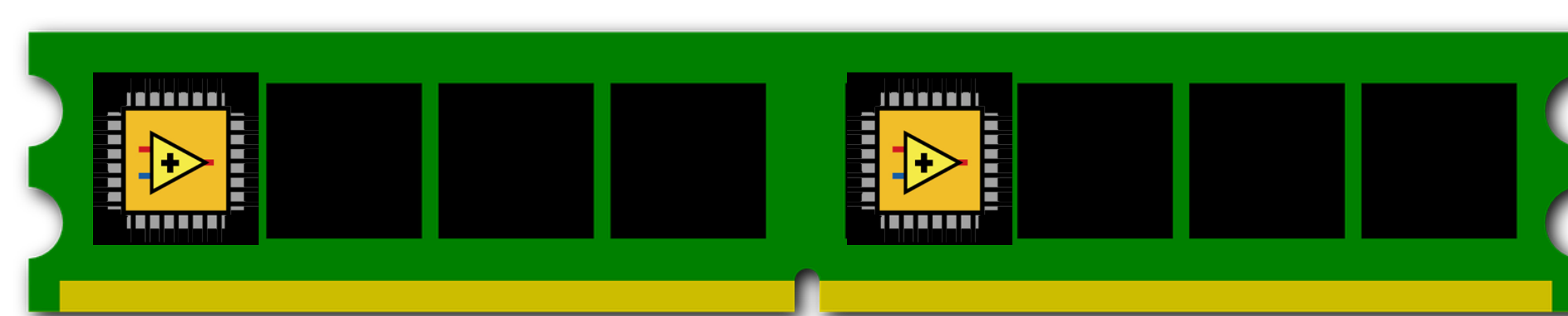
Why Software Solutions aren't Sufficient



Compression
Shared-Scans
Query-Sharing
Cache-Sensitive
Column-Store

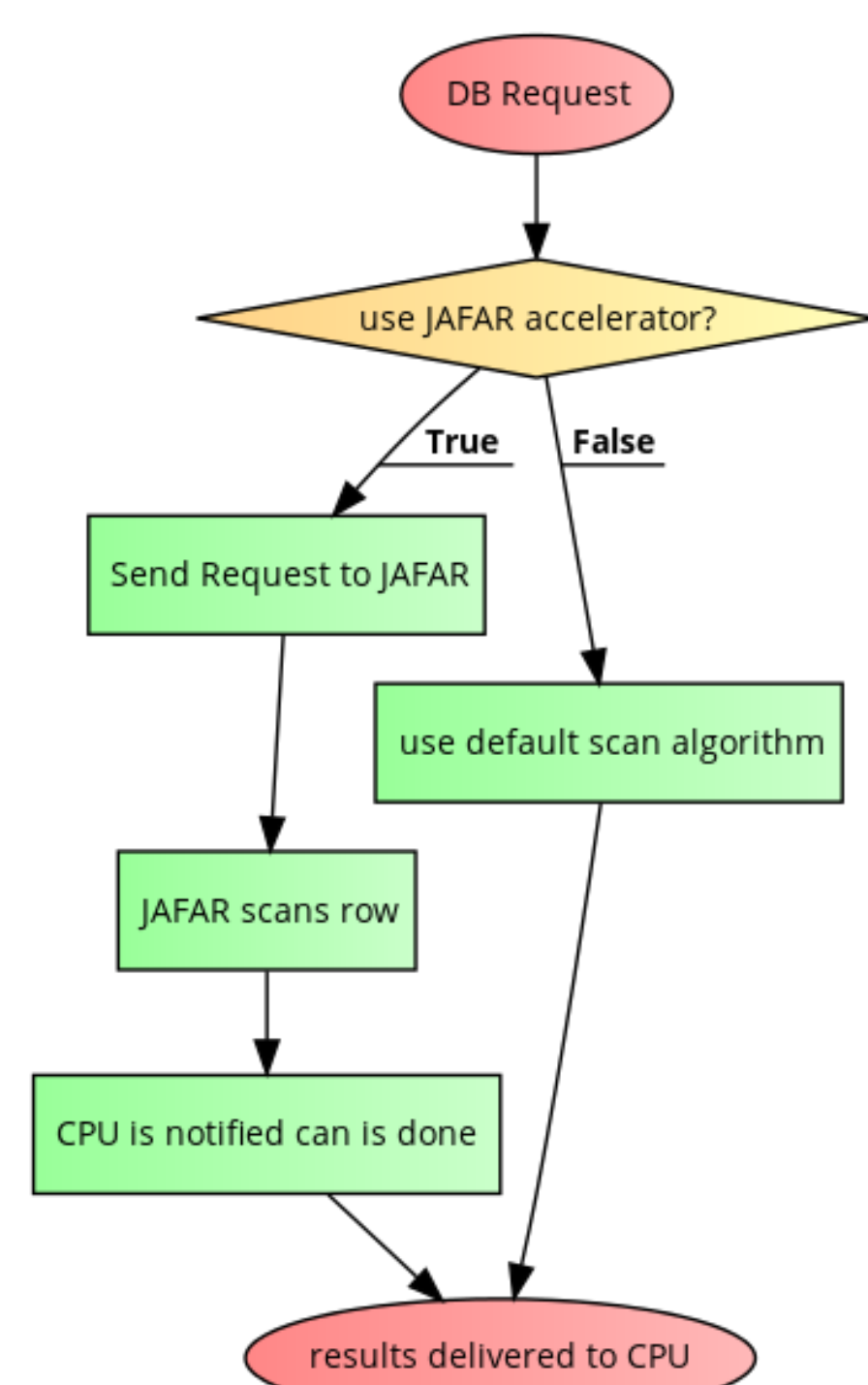
Fundamentally, all algorithmic and software solutions to the memory wall still requires moving data upstream in the memory hierarchy

Near-Data Processing



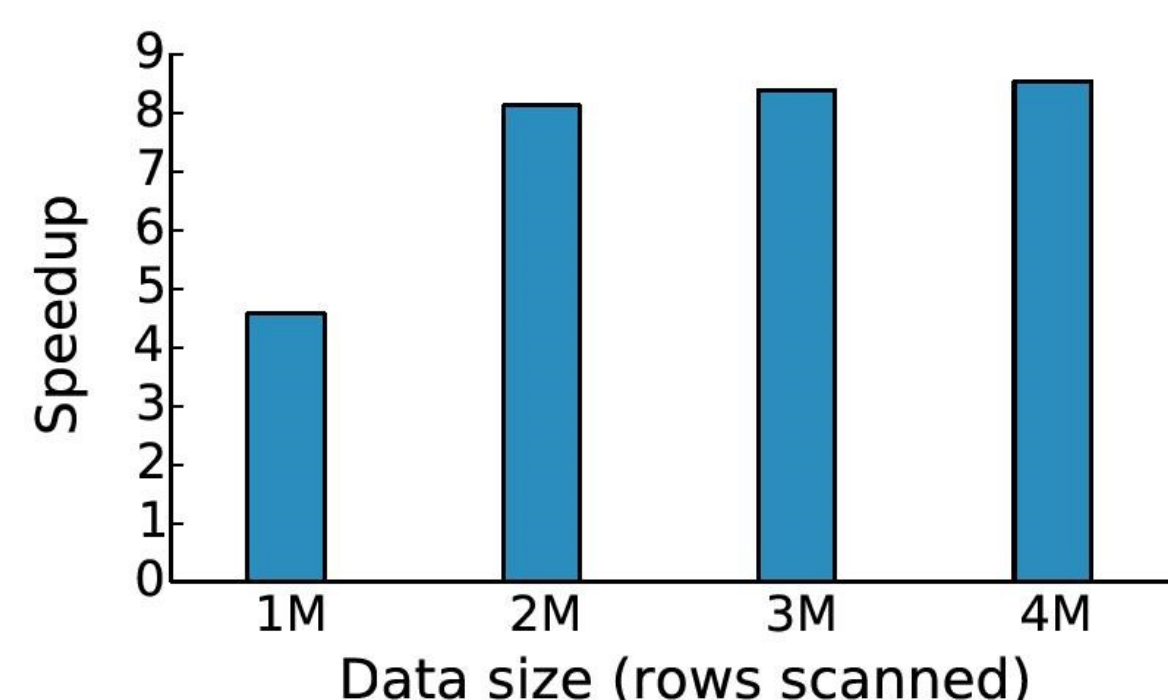
NDP moves computation down to memory hierarchy
Reduce memory bus utilization
Frees CPU to do other useful work
New opportunities for DB architectures

JAFAR Design

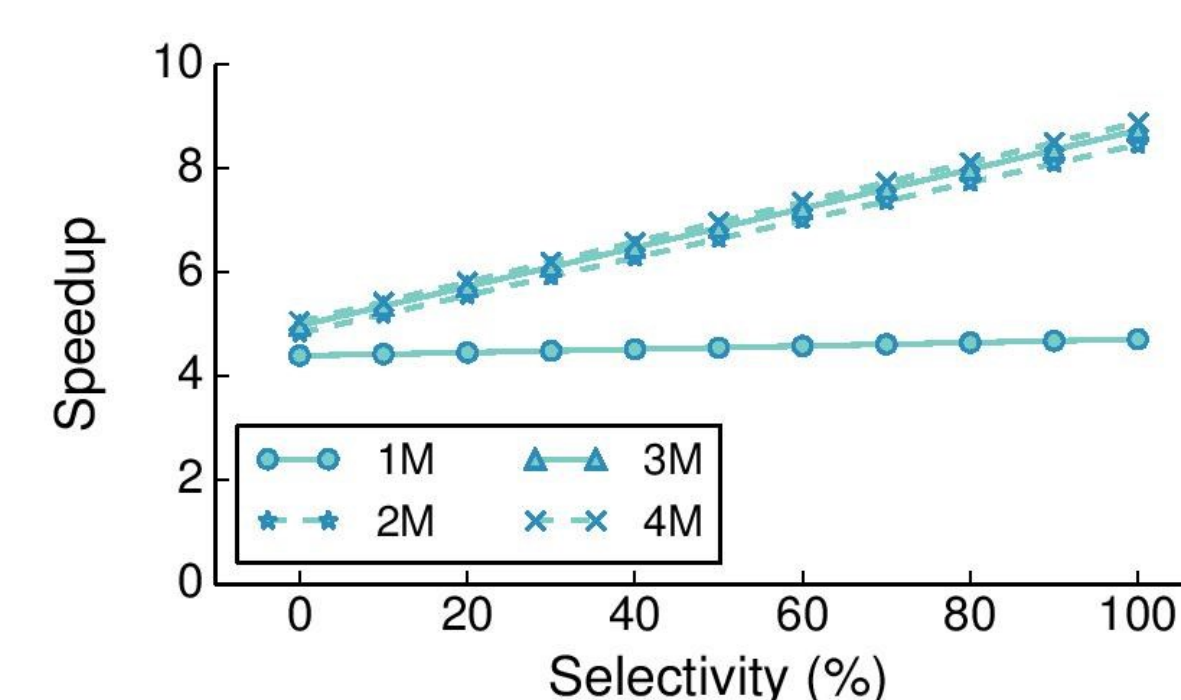


- JAFAR, : simple yet effective NDP Selections
- . Lives on the DRAM module
- . Two ALUs for comparisons
- . Write output to a page size buffer
- . Opcodes programmed by CPU

Experimental Results

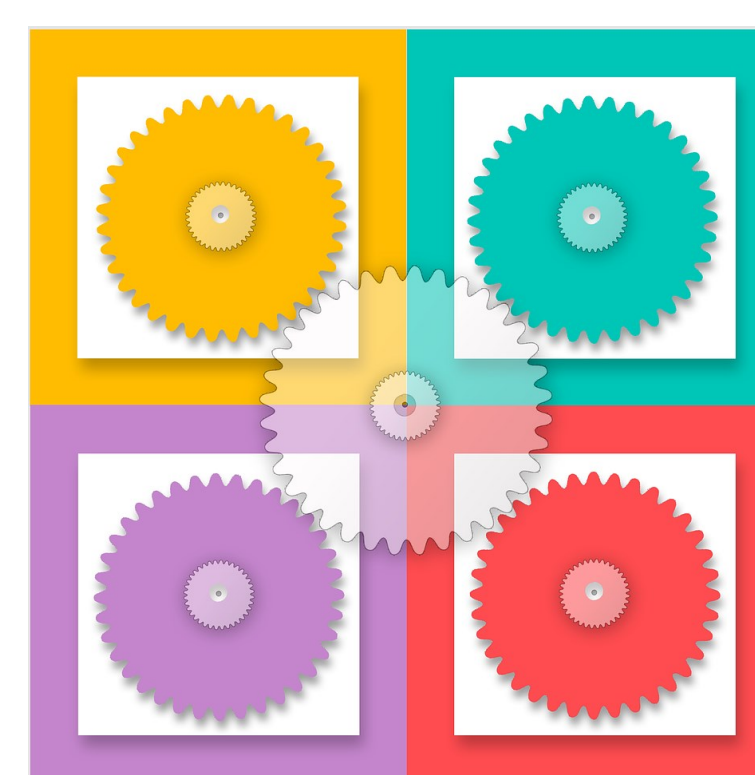


We achieve up to a 9x speed up depending on data size



Speedup is linearly correlated with query selectivity

Future Work



Develop similar hardware to handle more DB operators



Investigate how to break the memory wall without breaking the memory abstraction

