# M5. Caches

Explain the role of caches, how (and why) they work, and their impacts for programmers. Keywords: locality, write-through and write-back caches, associativity, LRU policy, memory mountain experiment.

Spatial locality – Lokalitet hvor sider i nærheden vælges

Temporal locality – Lokalitet hvor den samme side bruges.

Caches

* Importance of caches.
  + Lots of performance improvements
* Memory mountain.
  + Read through drops when the caches can't hold a full data block anymore
* Write-through and write-back caches.
  + WT: Keep a copy of the value written in the cache and write to memory.
  + WB: Keep a copy in the cache and only write back when the value is removed from the cache.
* Direct mapping and set associative caches.
  + Direct mapping er når en cache er mappet efter memory, og et tag markerer flere bits og hver bit skal være loaded i det korrekte nummer.
  + SAC har flere tags af samme størrelse, og kan søge i dem parallelt.
* Principle of LRU replacement policy.