Lecture 5.3

Monday, 18 September 2023 17:55

The CPU can only operate on data in the internal memory. If the data element is already in the internal memory, then the operation on that element can be executed immediately. If not, then the block containing that element first has to be read from disk. When the internal memory is full, then a block must first be written back to disk to make space.

The analysis of algorithms in the I/O-model aims to determine the number of I/Os (i.e. block transfers) as a function of n, M and B.

How an array is stored in external memory in blocks of size B is decided by the so-called blocking strategy. If the blocks are formed row-by-row, then the array is stored in what is known as ***row-major order***.

Writing a block back to external memory is also known as ***evicting*** that block. A *replacement policy* decides which block is evicted. A standard policy is *Least Recently Used*, also known as *LRU*.