CHAPTER 16

16.1

* Data in secondary or tertiary storage cannot be processed directly by the CPU; first it must be copied into primary storage and then processed by the CPU.
* Primary Storage:
  + Cache memory:
    - Used by CPU to speed up program execution by using techniques like pipelining and prefetching
    - Most expensive and fastest
    - Eg: Static RAM
  + Main memory:
    - Provides main work area for CPU for keeping program instructions and data.
    - Low cost, volatile and slow
    - Eg: Dynamic RAM
* Secondary Storage:
  + Magnetic disks- Mass storage in the form of CD-ROM and DVD.
  + Tapes are the least expensive
* Large main memory common – possible to load entire database in the main memory with copy in the secondary memory
* Magnetic disks (hard disks) have 1 bit basic unit of data. Bits are grouped together to form a byte( 8 bits) which represent a character
* In disk packs, tracks with the same diameter on the various surfaces are called a cylinder because of the shape they would form if connected in space. The concept of a cylinder is important because data stored on one cylinder can be retrieved much faster than if it were distributed among different cylinders.
* The division of a track into sectors is hard-coded on the disk surface and cannot be changed.
* Zone bit recording: A technique that allows a range of cylinders to have the same number of sectors per arc.
* In terms of IOPs (input/output operations) per second as a price to performance index, SAS is considered superior to SATA.
* Total time needed to locate and transfer an arbitrary block, given its address, is the sum of the seek time, rotational delay, and block transfer time.
* buffering of data is done in memory so that new data can be held in a buffer while old data is processed by an application.
* Disks are random access secondary storage devices because an arbitrary disk block may be accessed at random once we specify its address. Magnetic tapes are sequential access devices; to access the nth block on tape, first we must scan the preceding n-1 blocks.