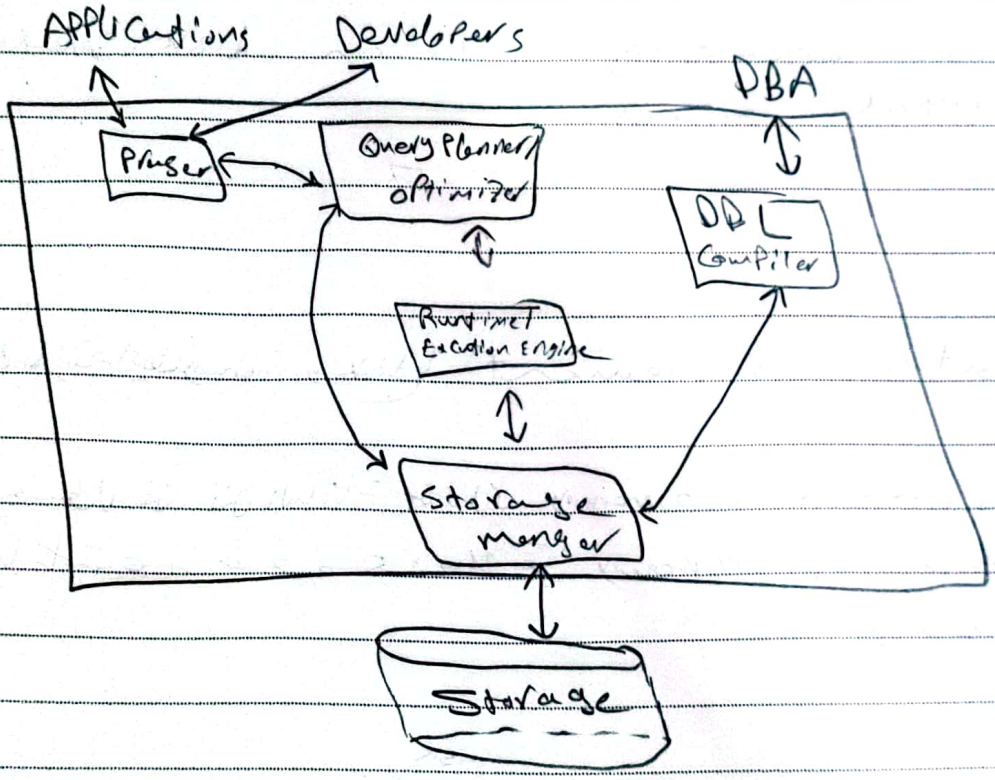
Lec 3

DataBase Storage Part 1

* DataBase structure



* Storage types

(reading per Bytes)

- CPU Registers (Volatile) (Random access)
- DRAM (Volatile)
- HDD (Non-Volatile) (sequential access)

(Blocks / Pages) reading per

- CPU Cache (Volatile)
- SSD (Non-Volatile)
- Network storage (Non-V)

Smaller faster more expensive

Larger slower

/ /

* What the qualities for the storage of the data base I should take care of when i build the storage?

(1) Manage data that exceed the available memory (وبالتالي هتتحط في الديسك)

(2) Minimize reading | writing to disk (expensive)

(3) When accessing data on disk, maximize sequential access

* Data Movement { disk و memory بتحرك بين data ازاي }

- المسؤول عن نقل البيانات من وإلى disk و memory وكمان بيشيك (check)

* هل البيانات موجودة في الـ memory ولا لأ

storage manager

* File | Pages → storage disk شكل البيانات في

- Database files — كل داتا بيز سيستم له files و formats خاصة به

• sys_specific file format

• OS does not understand the contents but the data base managment sys do

• single file | multiple files

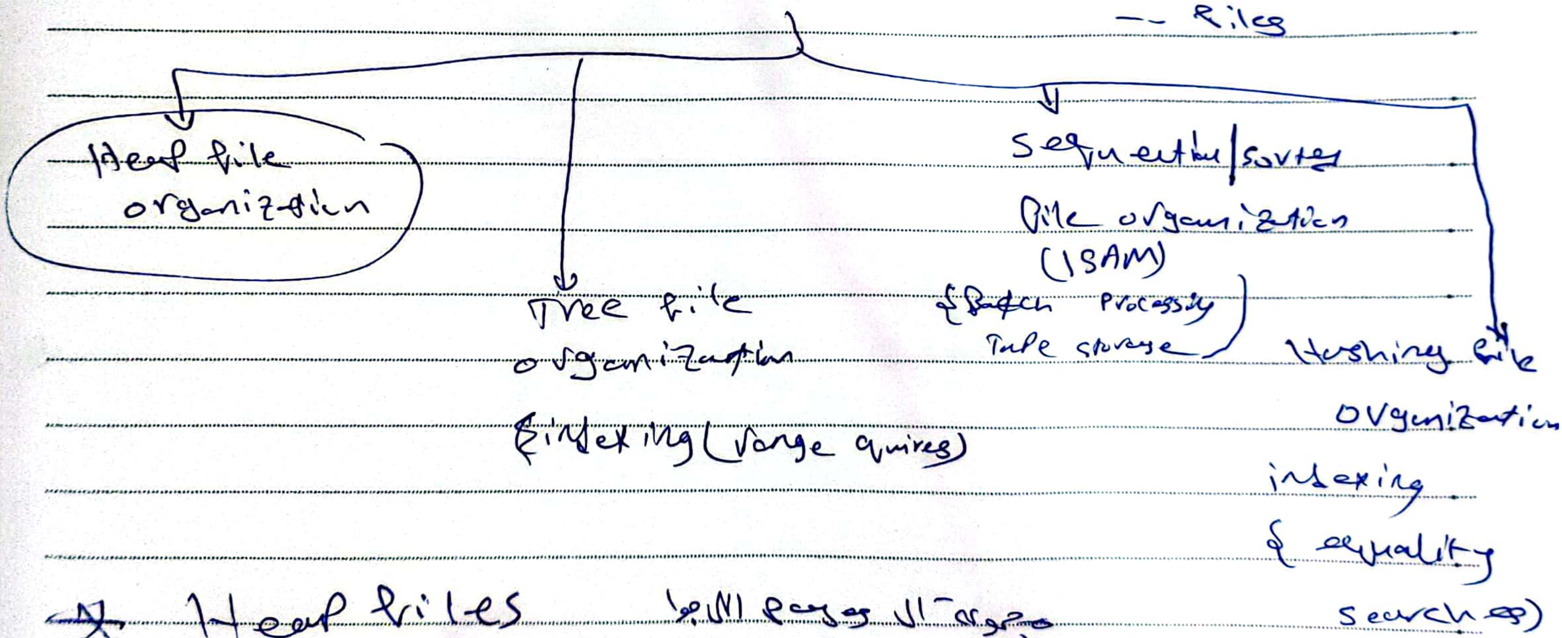
* كل file عبارة عن pages

الأقصى

What is a page?

- fixed - size block of data
- can contain anything
  - Tuples , meta data , indexes, log records —
- unique ID for each page
  - DBMS can map a page id to a physical location

* file organization ازاي الـ pages مترتبه في الـ files



* Heap files مجموعه الـ pages الي هيا unordered وكل file بيشاور علي الـ pages وكل ما هيا موجوده

* طب ازاي الاقي page معينة جوا الـ file

- Page Directory file موجود كفايل

كأنها table of content بتاع ال file

* special page(s) within each file
- tells you location of each data page in the file
  - Number of free "slots" per page
  - list of free / empty pages

* must be kept in sync with data pages
لـ تجدد مع كل تغير بيحصل