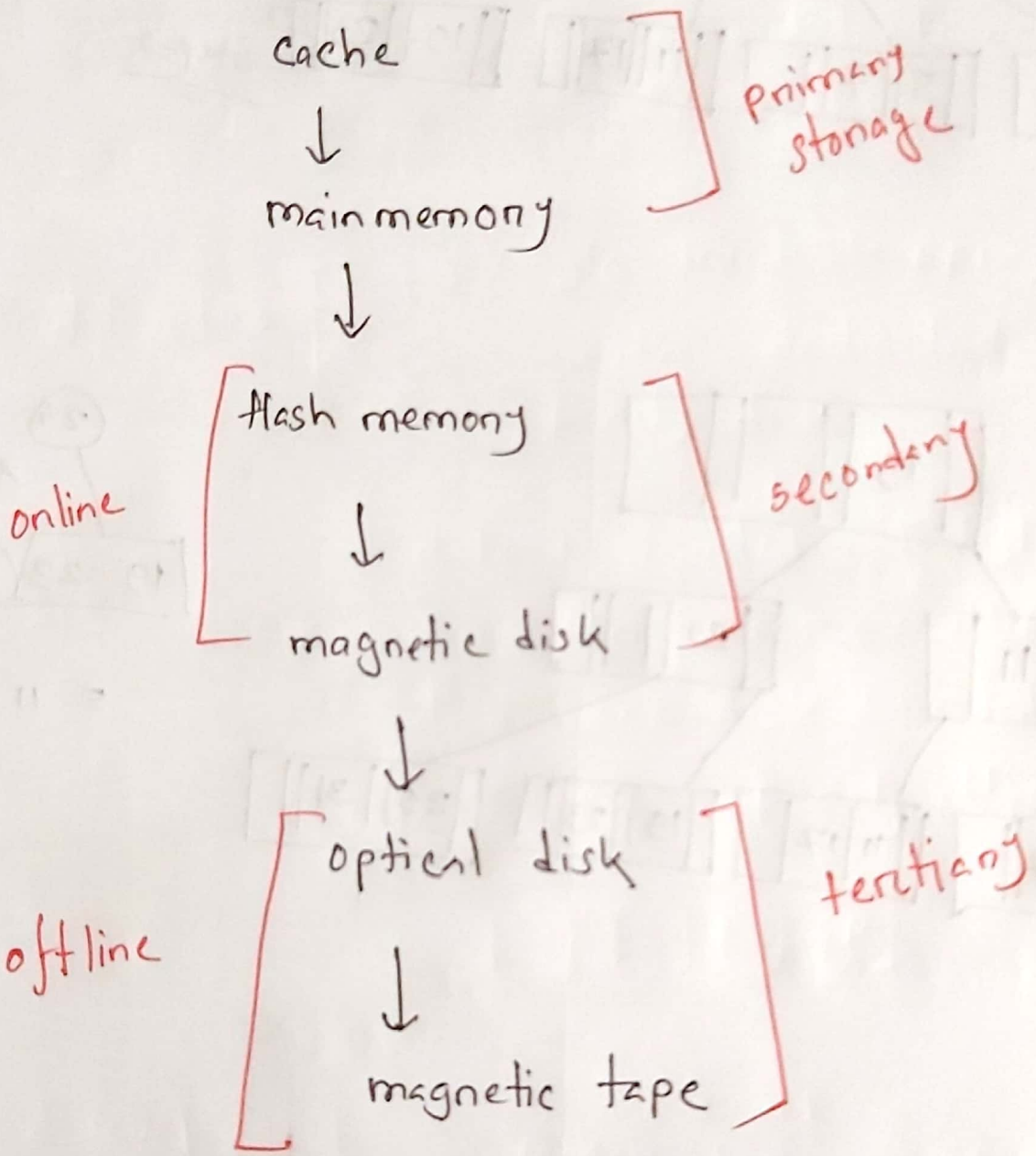
Storage Hierarchy



what is RAID

Redundant Array of Independent Disks

→ it is a technology used in computer storage to improve performance, reliability and capacity by combining multiple physical drives into a single logical unit

Raid Level-0

→ block stripping

→ it spreads data across disks without any redundancy & fault tolerance

→ often higher performance

no Redundancy
data loss

Raid level-1

→ mirroring disk

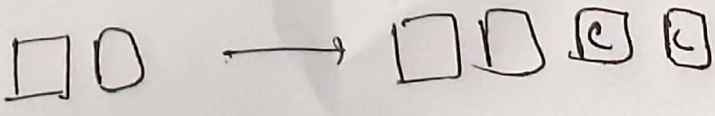
→ data redundancy

→ create an exact copy of each block on two seperate disks

→ best write performan.

→ best data protection

→ lower storage effiency



Raid Level-2

→ bit stripping

→ memeory style error eneoding

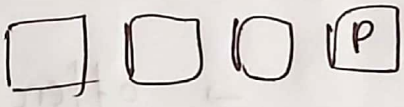
↘ use for error detection & connection

Raid level-3

→ byte level stripping with a dedicated panity disk

→ high transfer rate
→ error detection

→ data is divided into byts and written accoss moltiple disk, one disk dedicated to stoning panity info



Raid level - 4

Block Level stripping

rest same as 3

higher I/O rates

Raid level-5

→ distributes both data and panity in formation accross multiple disk

fault tolenance
higher perfonmance
effieent use

→ do not have dedicated panity disk

→ panity info is distnubeted across all disk

Raid level-6

same 5 but but provides additionl level of fault tolenanec

- use block level stripping with two independent panity disk (P, Q)

→ best fault tolenance

→ costly

→ can tolenate of any two disk failure simultaneously

Block level stripping

(1) didivides data into langen blocks on chunks

(2) Data blocks distnibuted accnoss multiple disk

(3) enable panallesim for each block

(4) Highen penfonmance

(5) & stnipping size kilobytes – megabytes

(6) less ovenhead

(7) best fon lange dataset and sequential access pattenn

Byte/ Bit level stripping

divides data at smallen gnanulanity

Individual bits / byte of data distnibuted accross ...

(3) enable ~~path~~ panallesim fon each bit

(4) Highen data transfen

(5) byte - byte

(6) mone ovenhead

(7) best fon high concunnency, nundom access pattenn

Block level stripping

physical block number = (logical block number − 1) % number of disk

Disk number = ((logical block number − 1) % number of disk) + 1