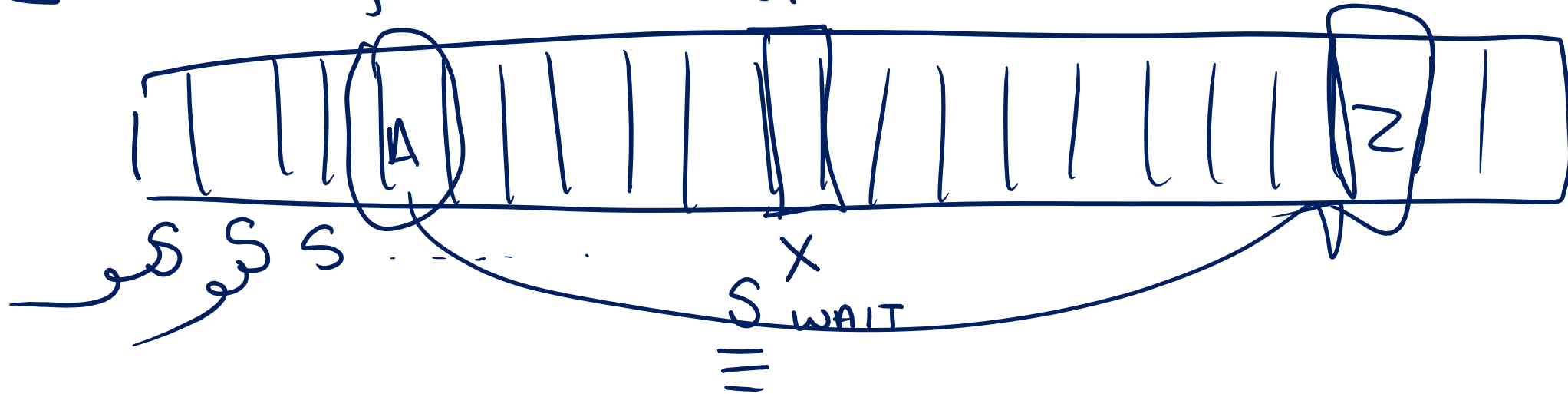


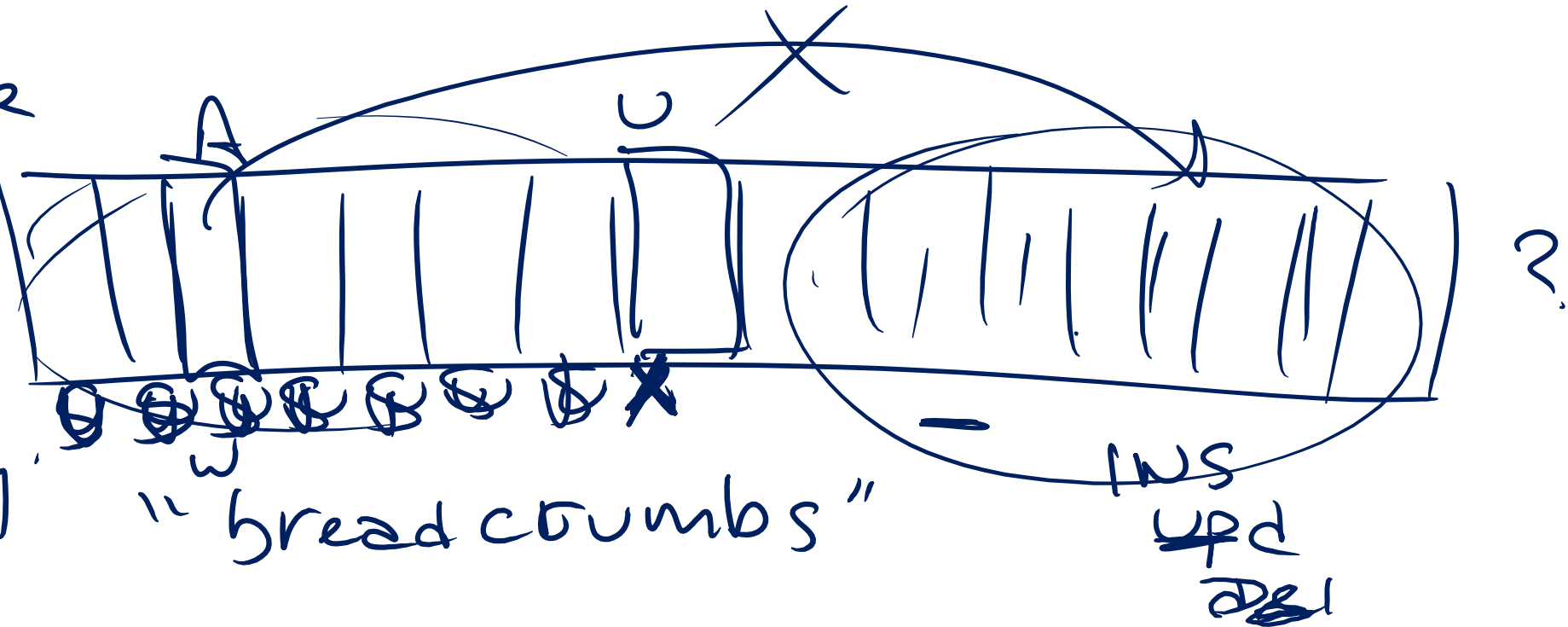
RC w/locking

Update



Repeatable Reads

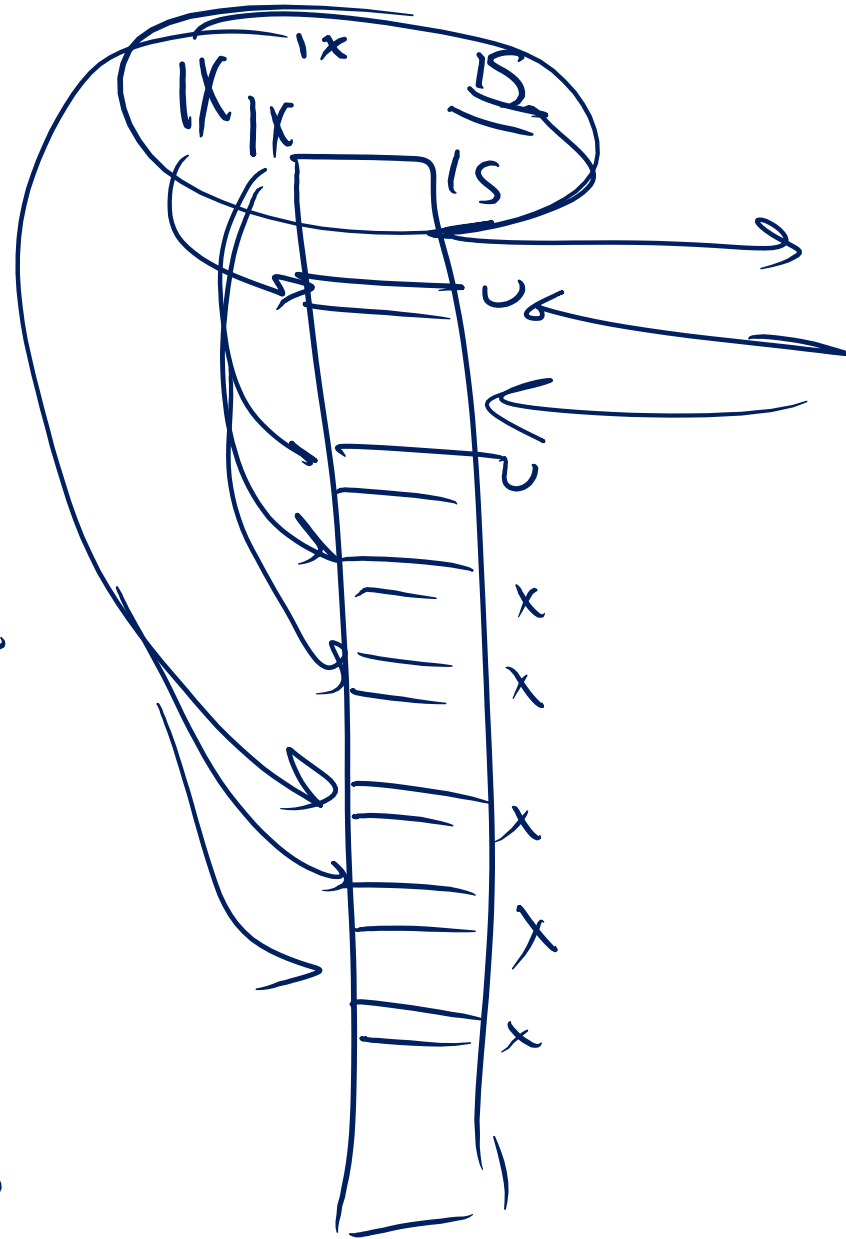
Count Query





SP\_recompile  
frame

Over here  
code



DISALLOW ~~ROW~~LOCKS  
PAG

Allow ~~PAG~~LOCKS  
Row

IX1

Key  
Inc

c4

c6

Update

Set c6 = ~

where c4 = x

~~PAG~~

c8

IX2

key c8

Inc c6

Update

Set c6 = ~

where c8 = y

BT  
update saving  
update check

CT

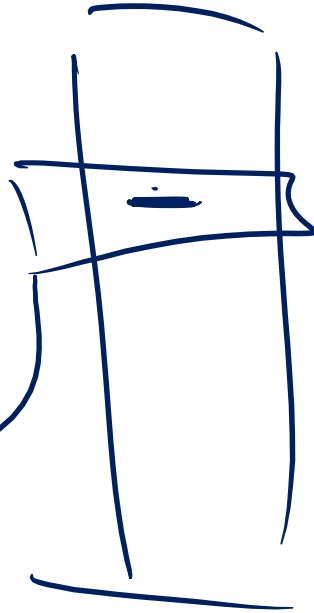
LOGICAL  
ORDER

+ phy

TRAN

BT  
update check  
update saving  
CT

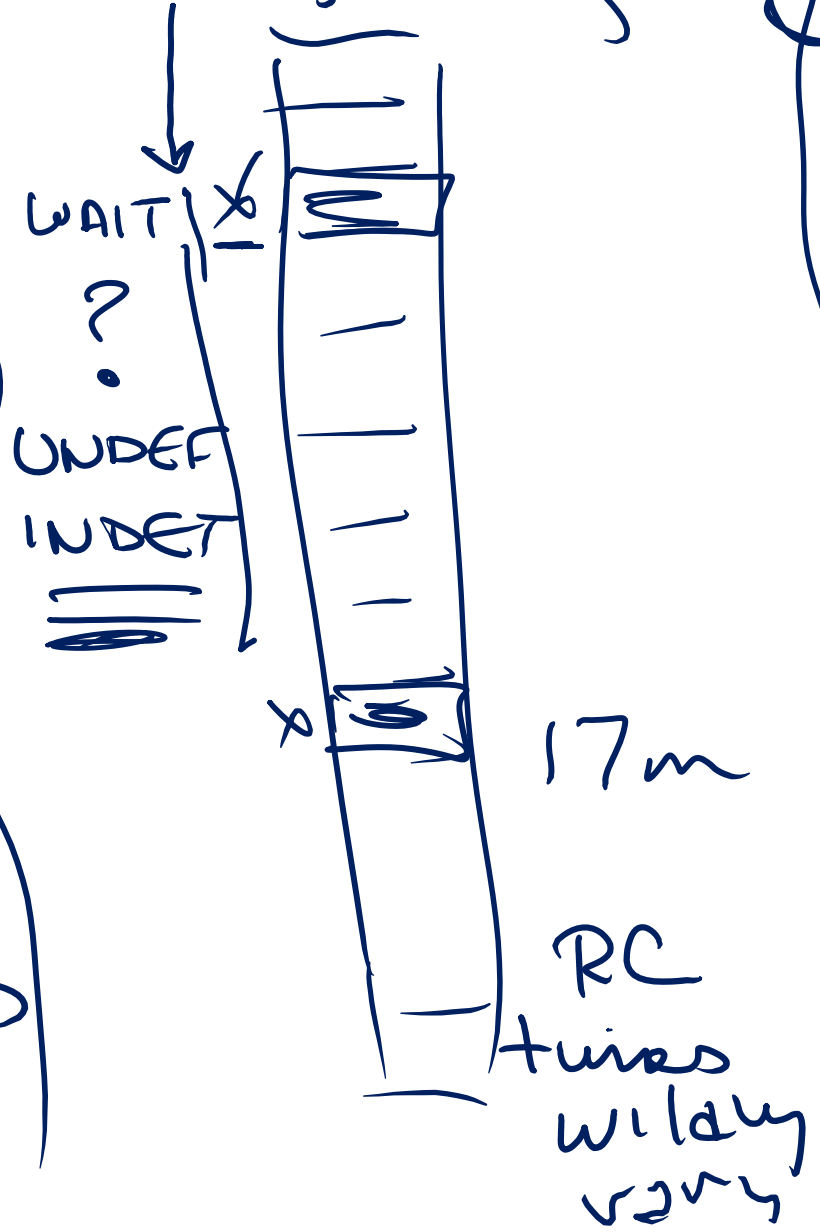
BT  
upd checking  
upd saving  
CT



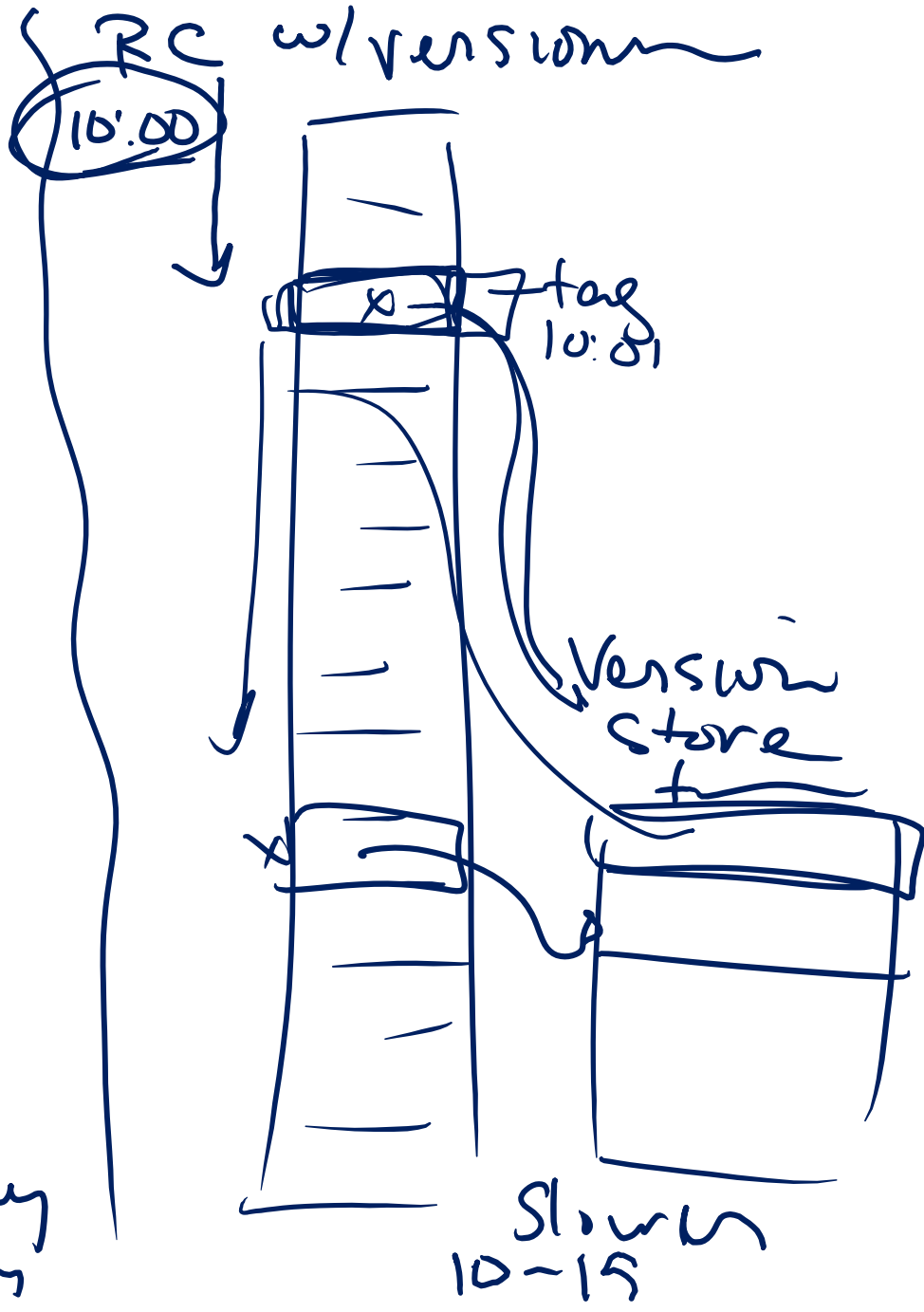
READ UNCOM.



Read Com Using locking



RC w/ version



Cow

PIT

Version

PIT Row

DB sn

PIT DB

Copy Before Write

Copy On Write

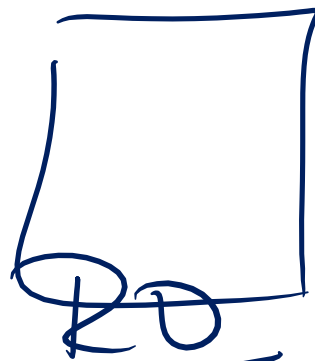
AGS

P



R

Secondary



Accuracy  
Concurrent

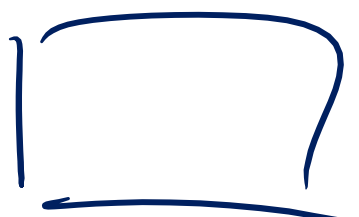
Statistics

Pub

D



Sub



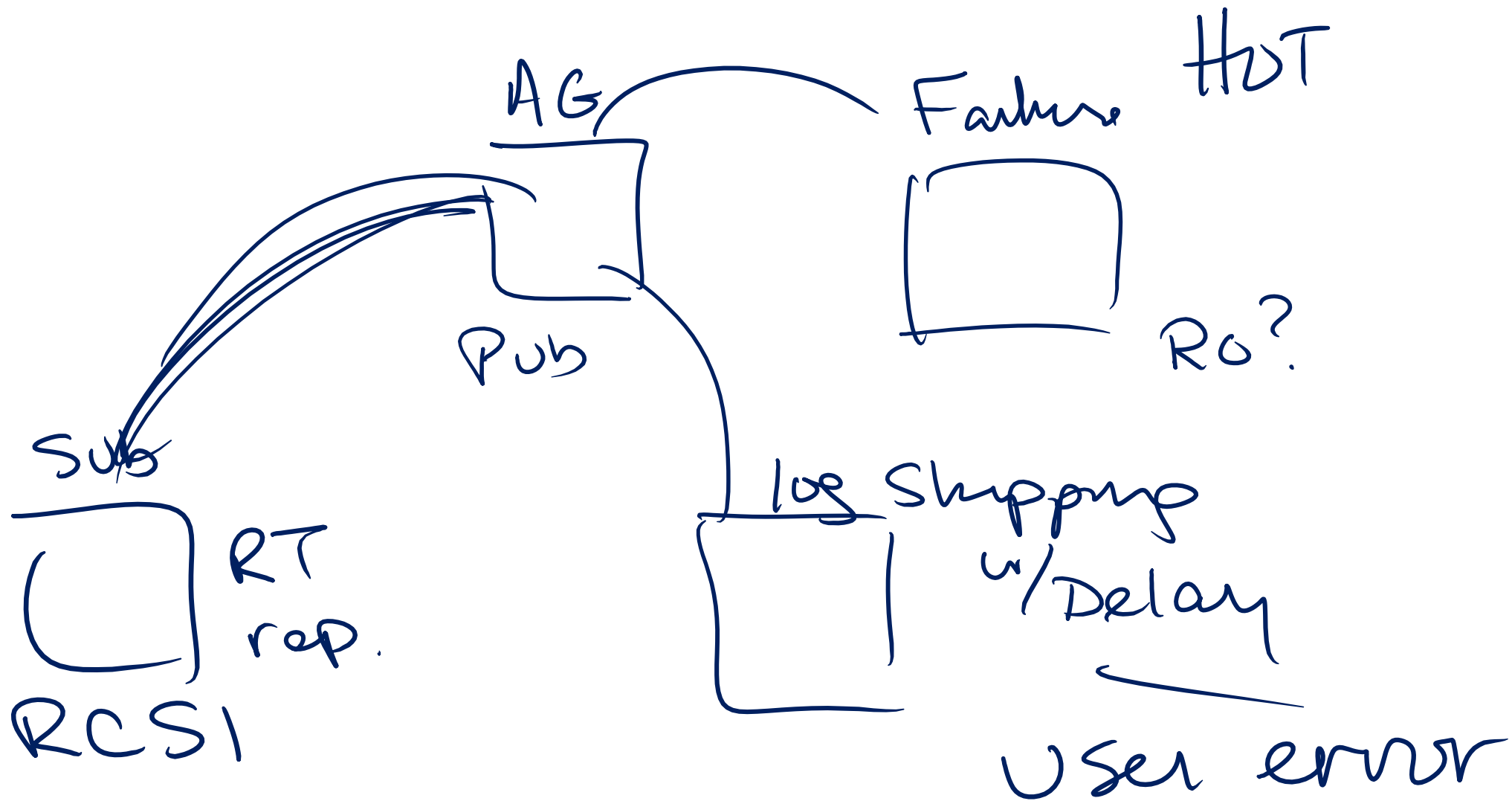
RCSI

Read-committed  
Snapshot

Acc  
Conc.

Indexes

Rep





IAM

BITMAP

96

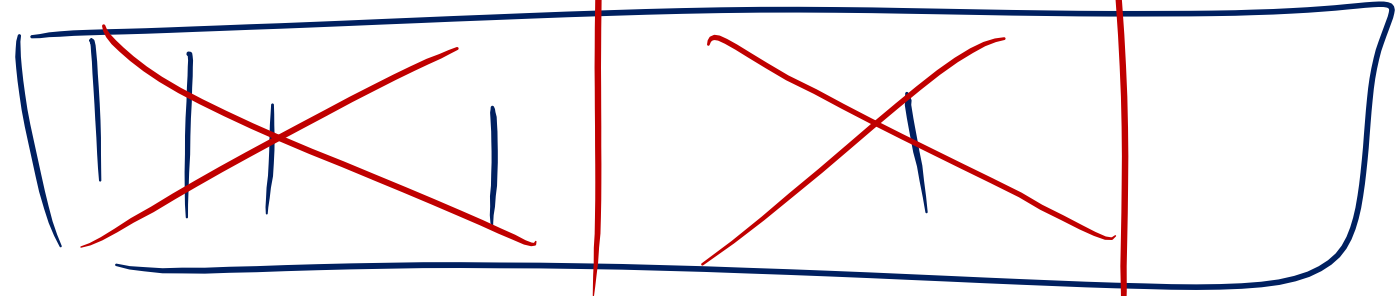
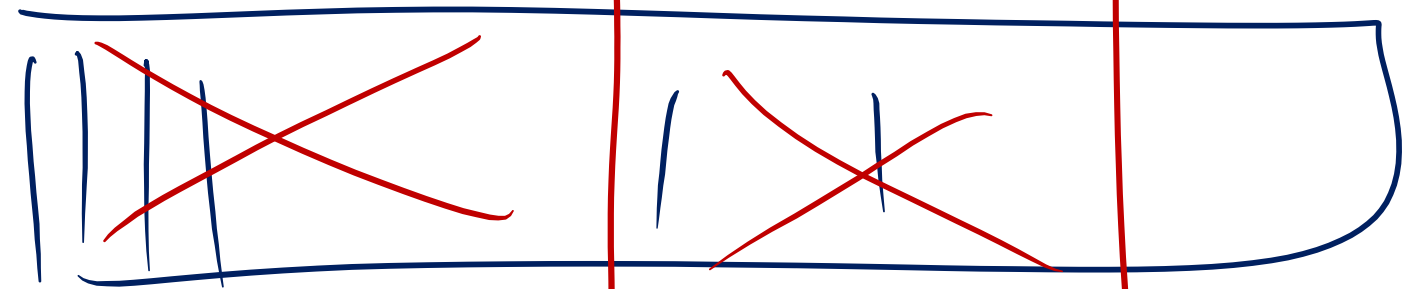
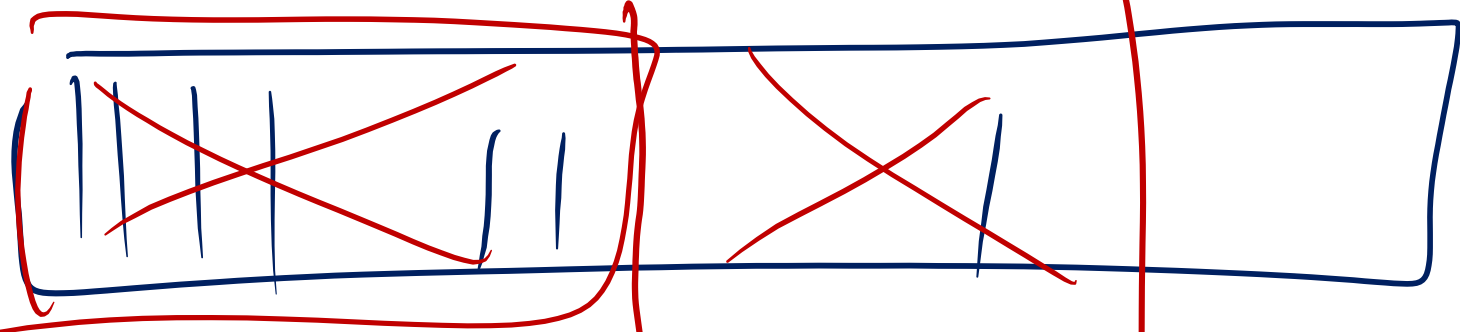


GAM

4GB

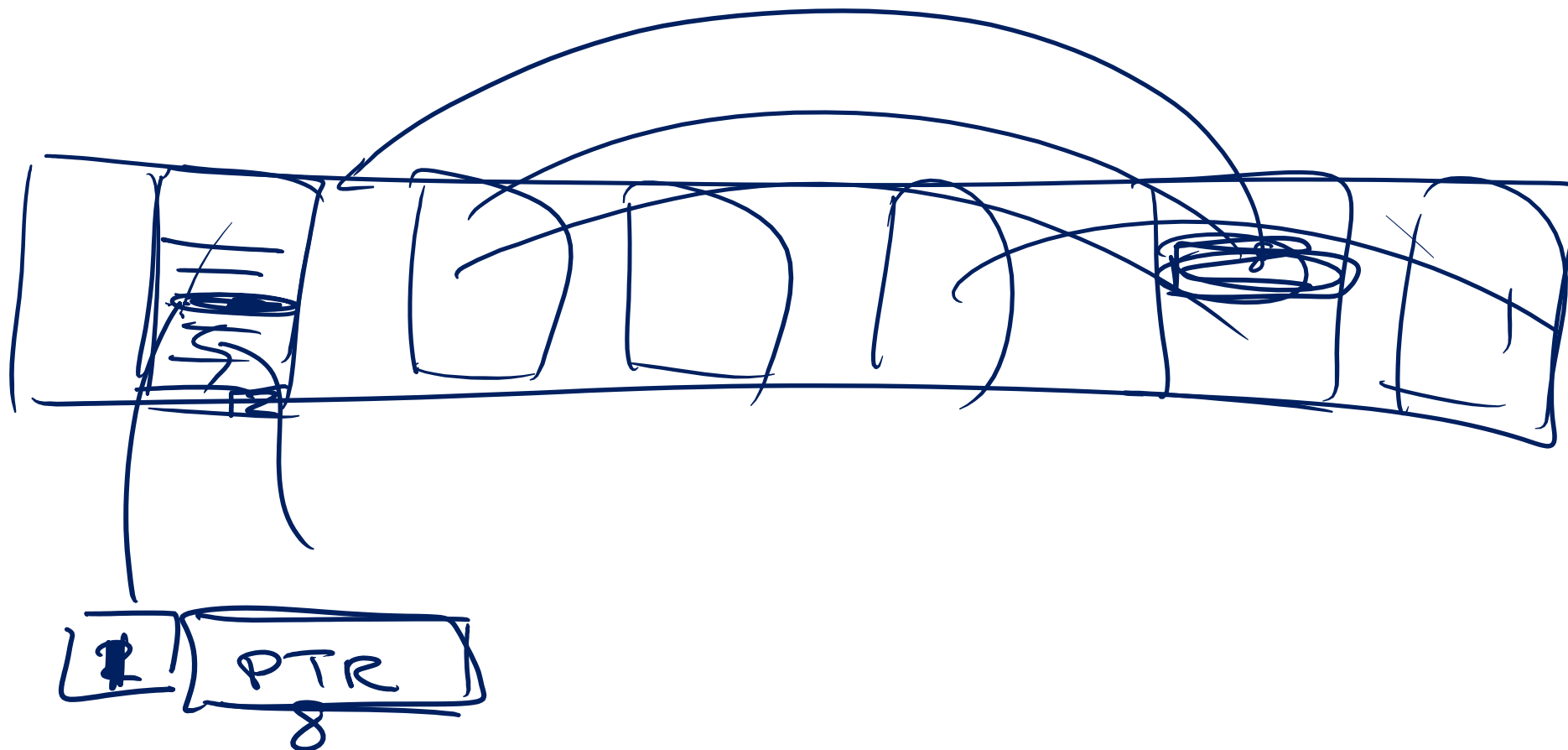
8GB

10GB



10GB

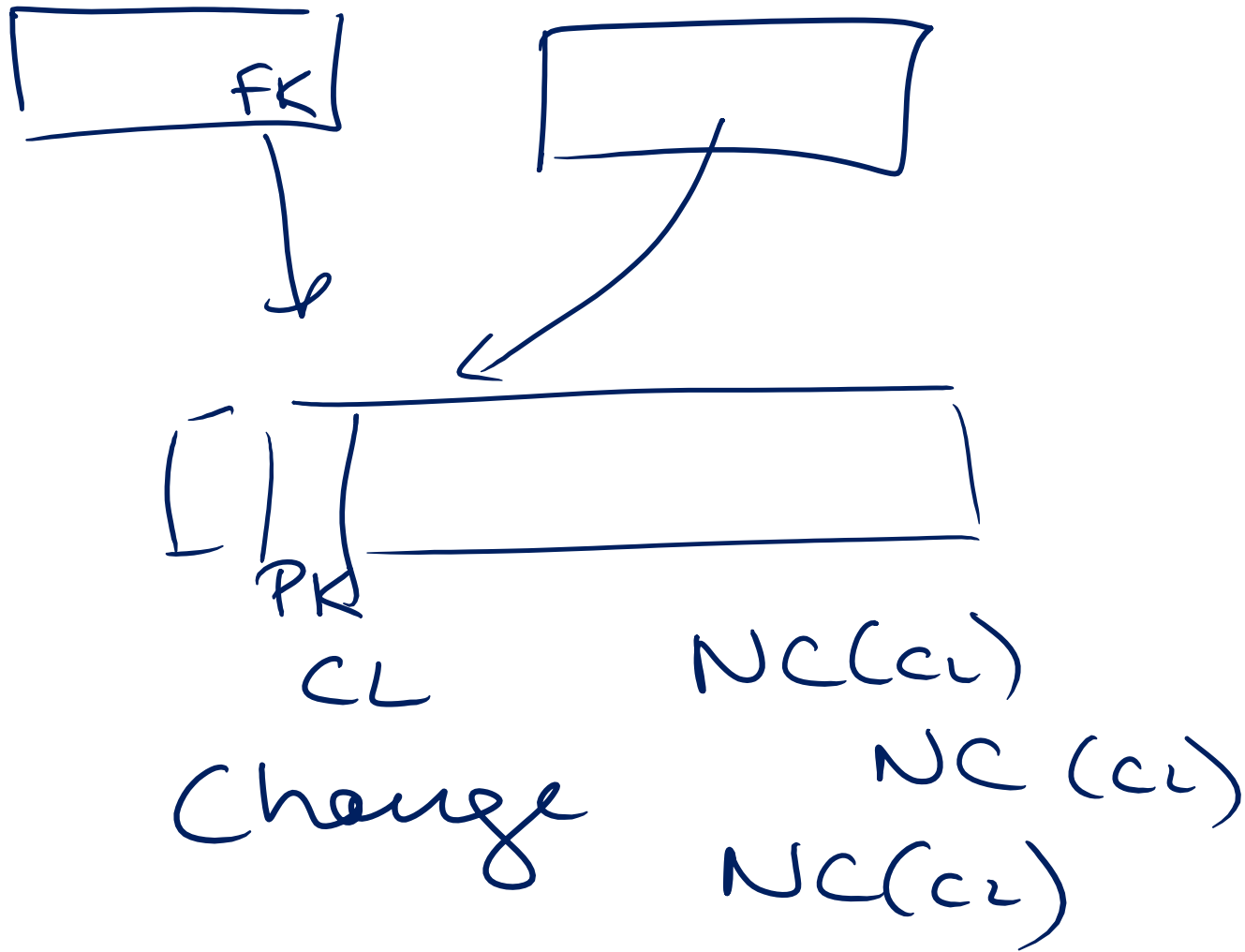
10GB





"CL" LN, FN, MI  
RO FRAG

NC Key  
1-20  
EVERY



OFFLINE

DROP FK

DROP NC

DROP CL

? Add ID

CREATE QL

CREATE PK NC

CREATE NC

CREATE FK

U P View  Selects / Deletes

UA V tables

Updates

(2000-2017)  
T

(2018)  
T

(2019)  
T

CS IVs

\*More indexes  
FULLSCAN ✓  
FF 100

Switch in

PT

A

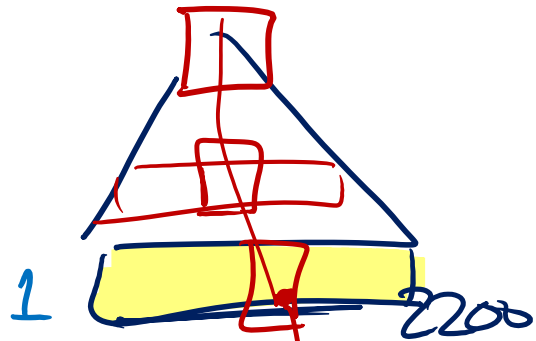
Constraint

date  $\geq 20190101$   
< 20200101

S | Oct 2020

Sales 2020  
DSE

3



NC col x, Lodcup  
int  
4  
D, int/big  
16

3

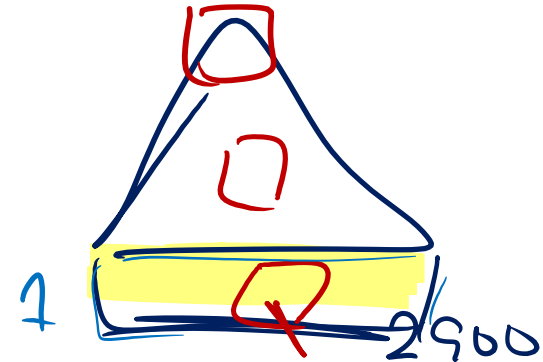


6

CL

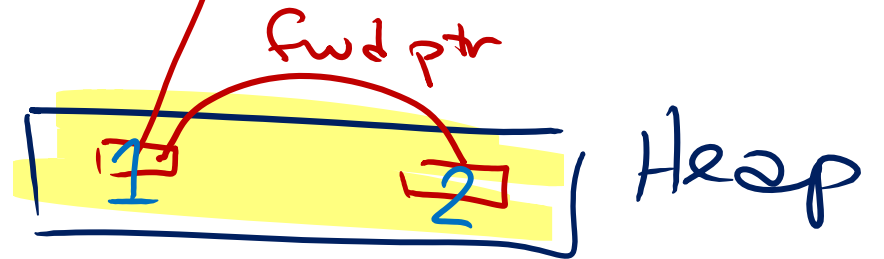
1.6m rows

3



NC col x, Lookup  
RID  
8

"fixed" Physical



4-5

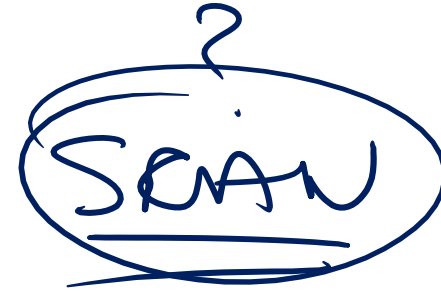
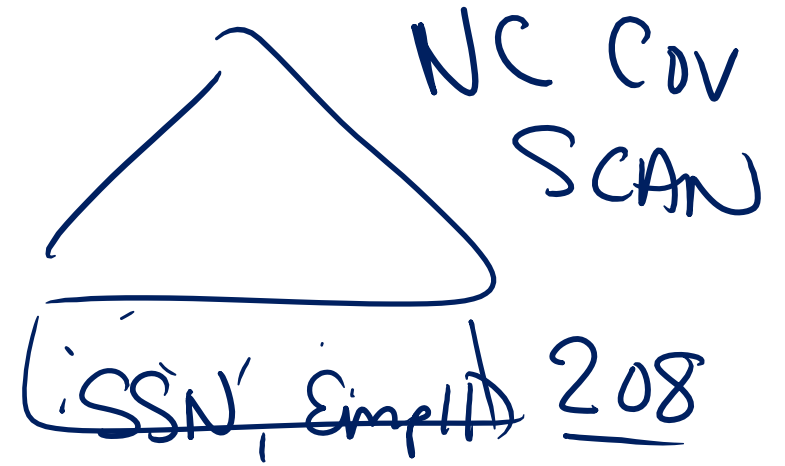
10K



< 10000

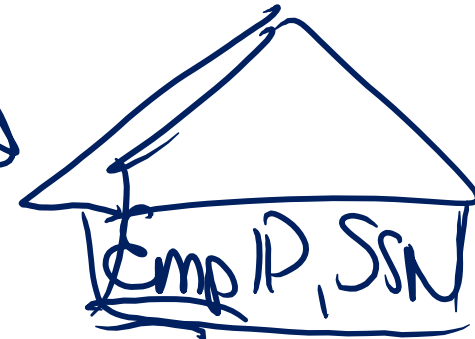
$$\frac{1}{8} 4000 = \underline{\underline{500}}$$

NC



208 "filter"

26 1/8



NC COV  
Seek

208

"E"

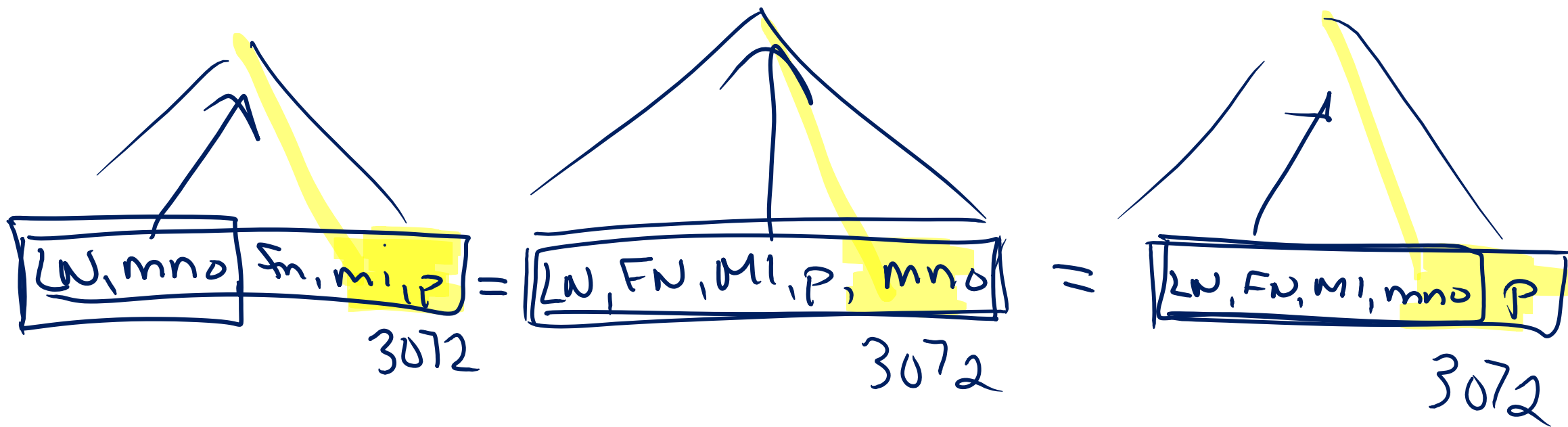
\*  $\frac{LN}{\text{Inc } FN, MI, P}$

"B"

$\frac{LN, FN, MI, P}{\text{Inc } P}$

"D"

\*  $\frac{LN, FN, MI}{\text{Inc } P}$

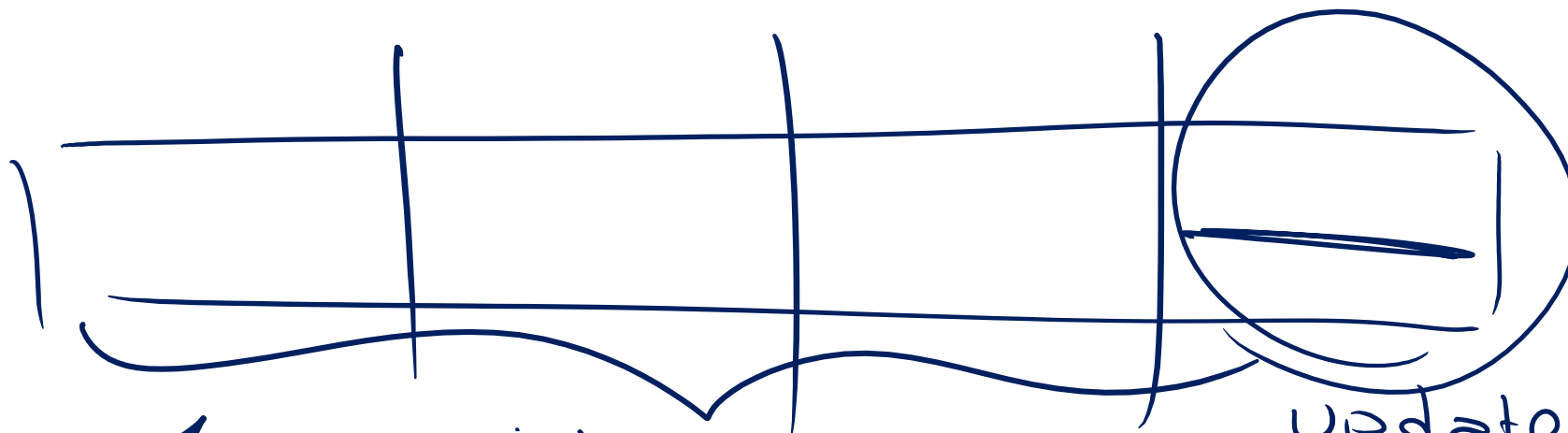


CL NO MNO





PT  
Sales  
date

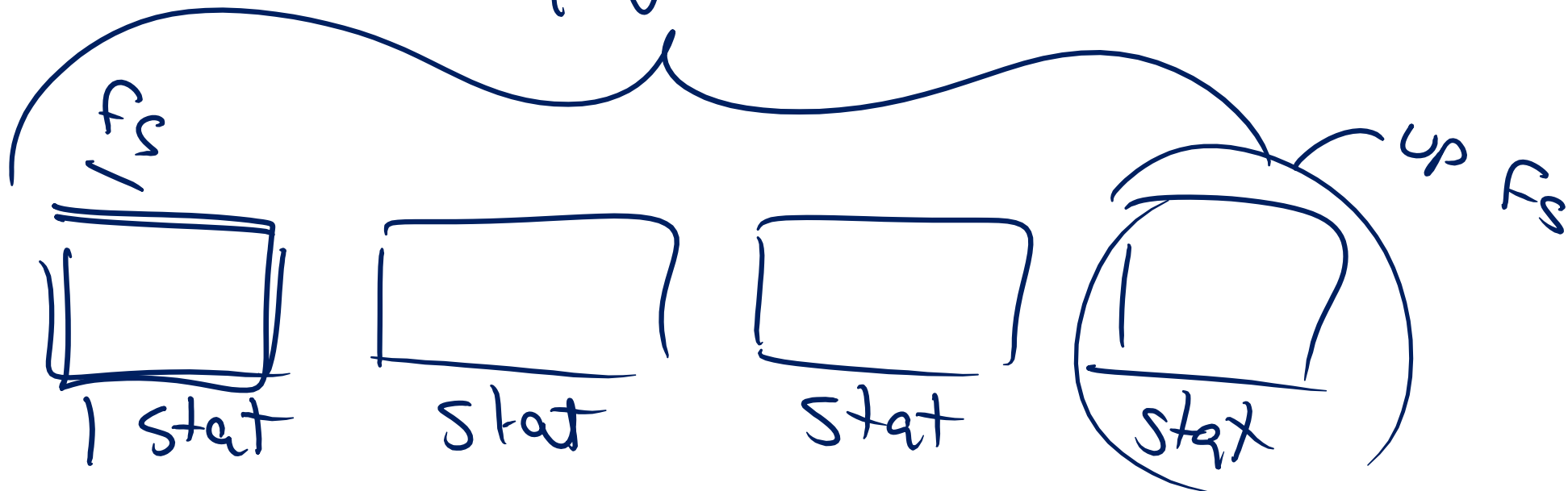


1 statistic

updates  
threshold

PV

PVs  
sep  
tables



1 stat

stat

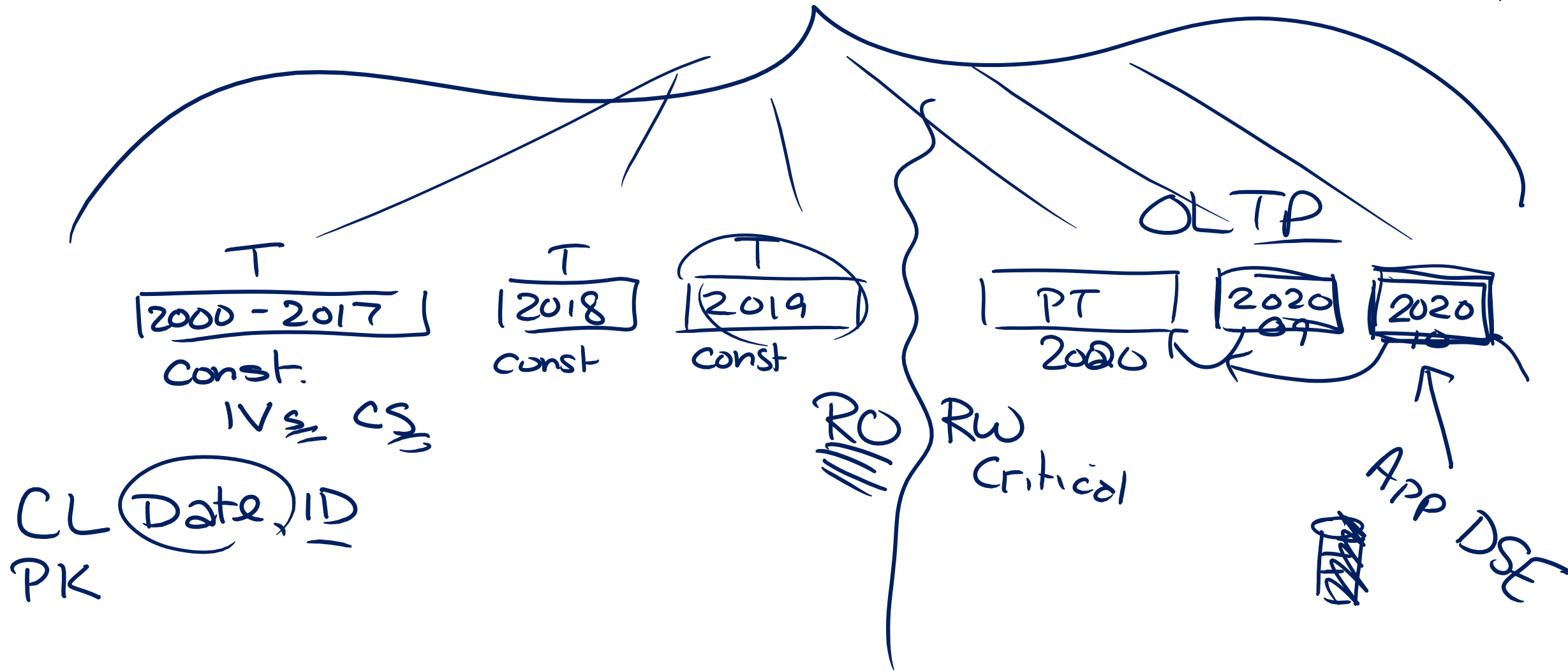
stat

stat

Up fs

\*

UPV Select/u/d where Part key



UCD

Unf Car Dee

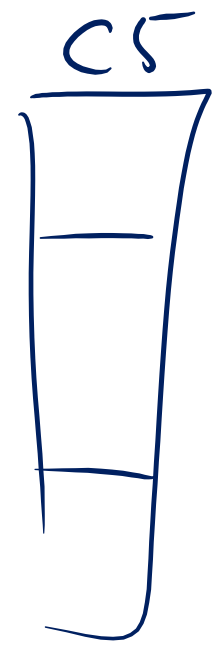
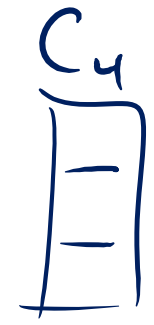
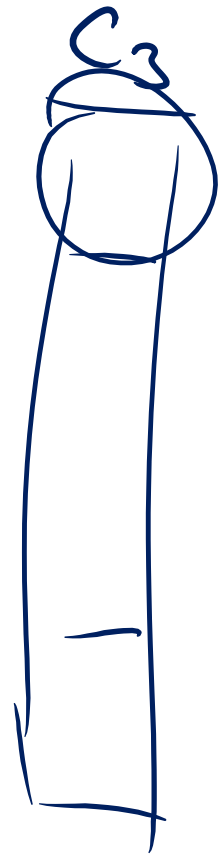
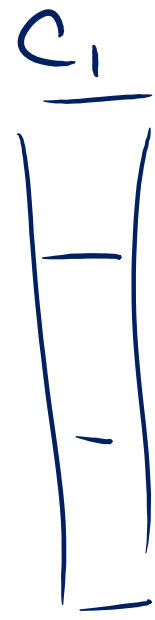
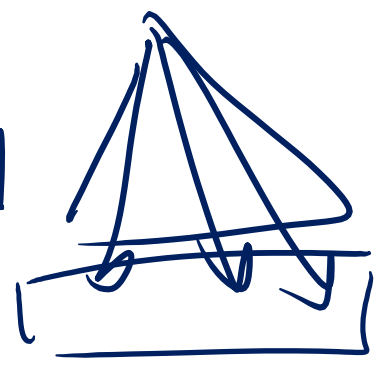
---

URLT

RS

Key

inc



$\sim 1/m$  Segments

CL RS

NC RS

NC CS

IVs