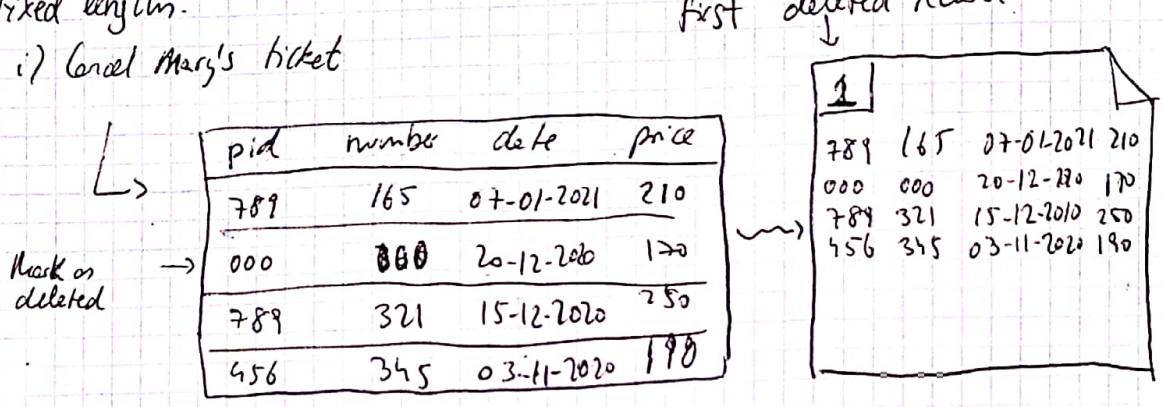
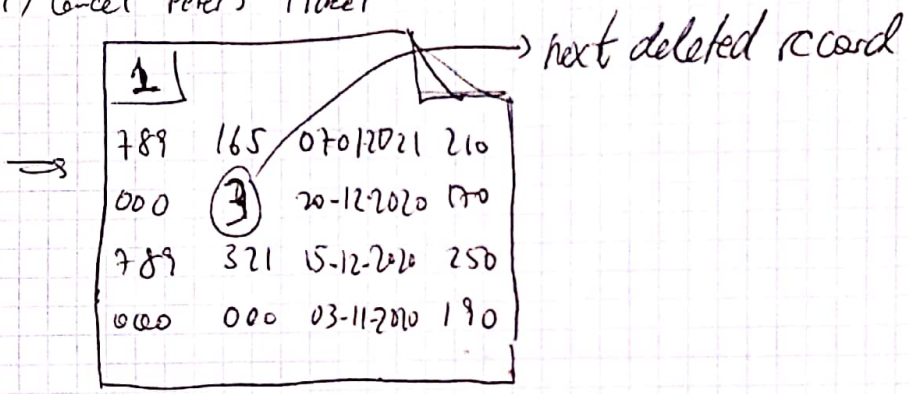
Pablo Cuesta Sierra · 125. EDAT exercises.

(39) a) No, because it seems that fields of the records are of fixed length.

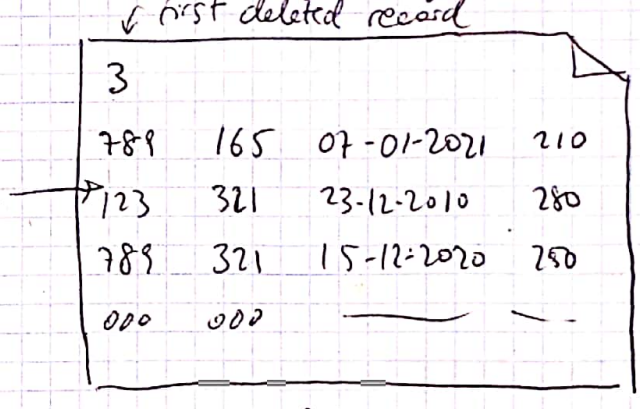
b) i) Cancel Mary's ticket



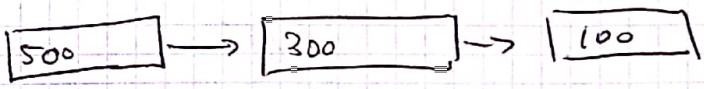
ii) Cancel Peter's Ticket



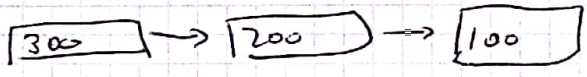
iii) Book a ticket for Mary ...



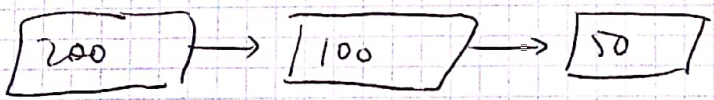
(40) Deletion: worst fit

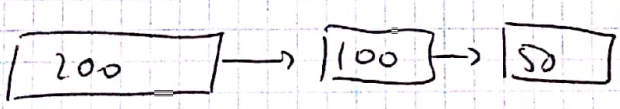


a) Record of 300 bytes inserted → in deleted record of 500, so 200 left → sort

Deleted records after op: 

b) Record of 250 B inserted:



c) Record of 400 B: 

inserted at the end

(42 b) 5000000 records, $\frac{400 \text{ Bytes}}{\text{record}}$

Records using a buffer of 400 000 B

So for each read we can take

$$\frac{400\,000 \text{ Bytes}}{\text{read}} \cdot \frac{}{400 \text{ Bytes}} = \frac{1000 \text{ records}}{\text{read}}$$

We need to read $5000\,000 \text{ records} \cdot \frac{1 \text{ read}}{1000 \text{ records}} = 5000 \text{ reads}$ in total

Seek + latency time $= 5000 \cdot (\text{Avg. seek time})$

$= 5000 \cdot 8\text{ms} = 40000 \text{ ms}.$

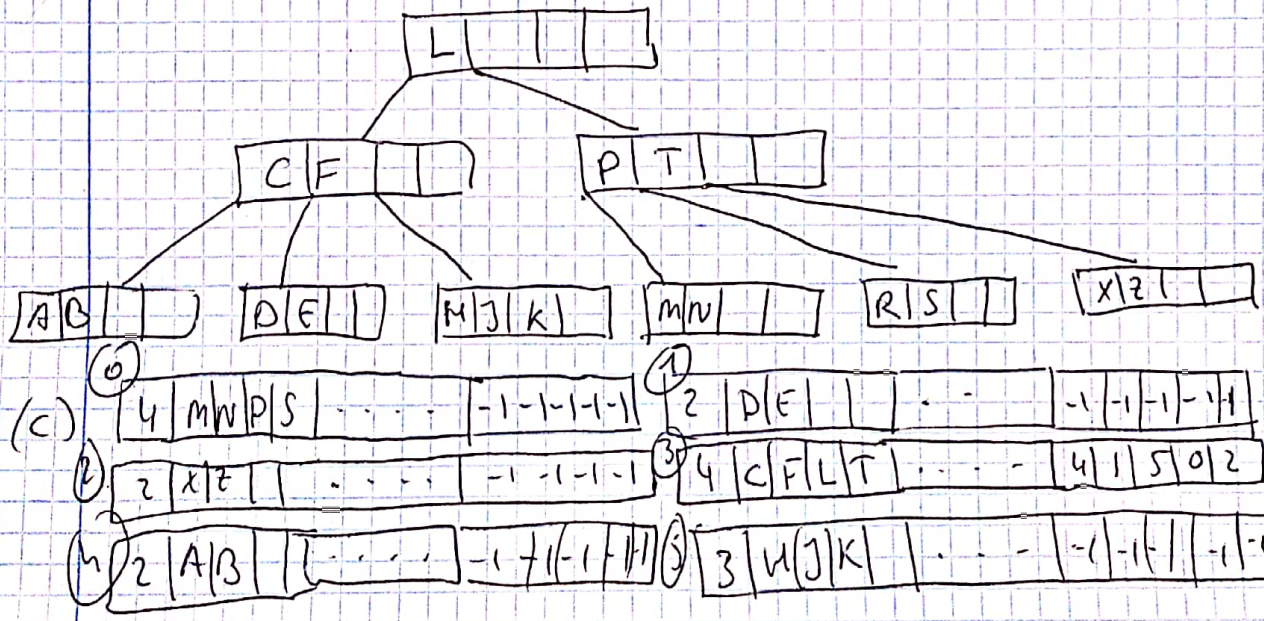
Transfer: (we can count the total)

$$5000000 \text{ records} \cdot \frac{400 \text{ Bytes}}{\text{record}} \cdot \frac{\text{sector}}{1000 \text{ Bytes}} \cdot \frac{\text{track}}{500 \text{ sectors}} \cdot \frac{\text{minute}}{15000 \text{ tracks}} \cdot \frac{3600 \text{ seconds}}{1 \text{ minute}} \cdot \frac{1000 \text{ ms}}{1 \text{ second}} = 960\,000 \text{ ms}$$

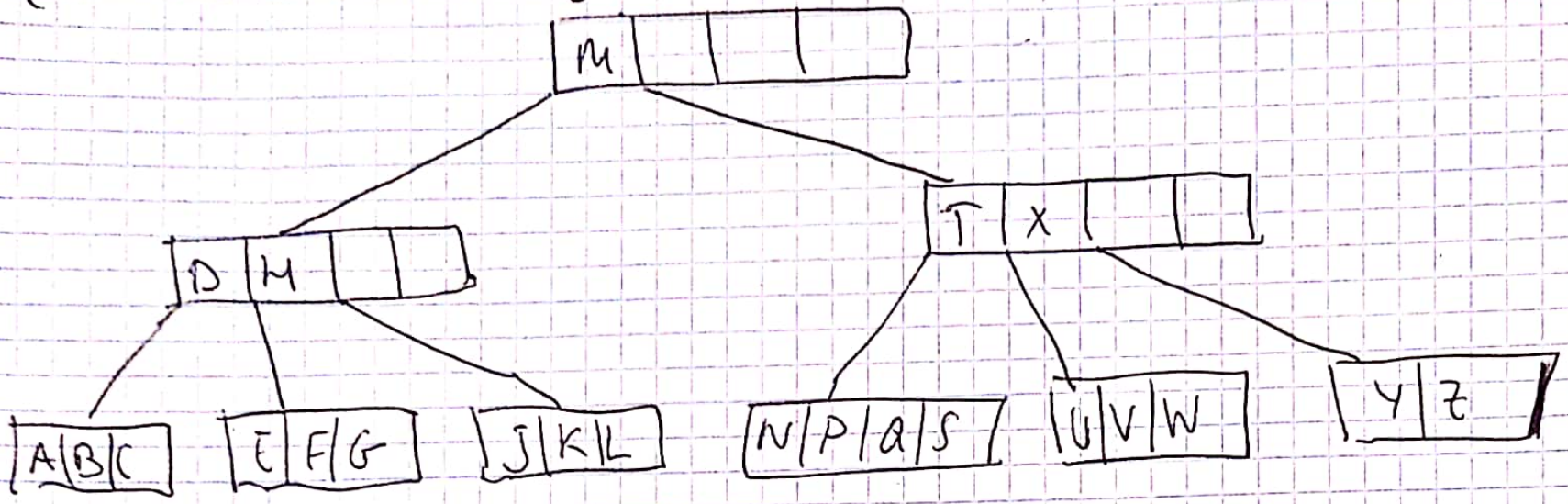
$$\boxed{((\text{Seek} + \text{latency}) \text{ time}) + \text{Transfer} = 1000\,000 \text{ ms}}$$

(51) After inserting 'R'. M N P [R S

C F] L [P T



(53a) After insertion of 'x'



(61a) Nodes with height: $0 \rightarrow 1$ Node

$1 \rightarrow k+1$ Nodes

$2 \rightarrow (k+1)^2$

$\vdots$

$h \rightarrow (k+1)^h$ Nodes

$$\text{Nodes} = \sum_{i=0}^{h} (\text{Nodes with height } i) = \sum_{i=0}^{h} (k+1)^i = \frac{(k+1)^{h+1} - 1}{k+1-1}$$

$$= \boxed{\frac{1}{k}\left((k+1)^{h+1} - 1\right)}$$