Homework 5:

Additional: M = 20 pages (memory)

registration: 1000000 records, 25000 pages

accidents: 10000 records, 148 pages

No of tuple / page $= \lceil 4096 / 20*5 \rceil = 40$

① use hash index for the owner

$$cos = \lceil 1.2 * \frac{1000000}{250000} \rceil = \lceil 4.8 \rceil = 5 \text{ pages.}$$

② No of pointer / page $= \lfloor (4096 - 4)/(20 + 4) \rfloor + 1 = 171$

height of B+ tree $= \log_{\frac{171}{2}} \lceil 100 \rceil = 2$

# of qualifying leaf nodes = 1 (toyota only)

# of qualifying tuple $= \frac{1000000}{100} = 10000$ tuples

total cost $= 10000 + 2 = 10002$

③ (primarikey) No of pointer / page $= \lfloor 4096 - 4 / 20 + 20 + 4 \rfloor + 1 = 94$.

height of B+ tree $= \lceil \log_{\frac{94}{2}} 10000 \rceil = 3$.

# of qualifying leaf node $= \frac{\lceil 10000 * \frac{1}{10} \rceil}{\frac{94-1}{2}} = 22$.

cost $= 22 + 3 \# - 1 = 24$.

④ result of q2 occupies 250 pages (10000/40)

generate write and read in result in resul of qurey 2 is 10502

$$24 + \frac{\lceil 227 \rceil}{20-2} * 250 + 10502 = 11,026 \text{ pages}$$

↑(M)

④ Do from beginning

park 3:

our pages holds 40 records;

puppies	80000 tuples	,	2000 pages
kennels	2000 tuples	,	50 pages
tricks	100 tuples	,	3 pages
puppytrick (pt)	240000	,	6000 pages

pages = $\lceil \frac{100}{40} \rceil$ = 3 pages

Q1 (puppies ⋈ PT) ⋈ tricks

secondary index: pname in puppies

secondary index: pnumber in PT

assume secondary B+tree on pname

height of B+tree = 4 for pname in puppies

# of qualify tuples is 1

Cost find qualifying puppies tuples = 4 + 1 = 5.

assume secondary B+tree index on pnumber in PT

height of B+tree = 4.

# of qulify tuples is 3.

partial cost = 4 + 1 + 4 + 3 = 12

If it's primary index, # of qualying pages = $\lceil \frac{3}{40} \rceil$ = 1

cost = 4 + 1 + 4 + 1 = 10.

$\leftarrow$: (puppies $\bowtie$ pt) $\bowtie$ kennels.

primary index

Trick ID, skill level on pT

secondary index

Pnumber of puppies

height of B+tree for Trick ID, skill level

$h = 2$.

# of leaf nodes $= \lceil \frac{500}{91-1} \rceil = 12$.

assume secondary index

qualifying tuples $= \frac{240,000}{500} = 480$

partial cost $= 2 + 480 = 482$.

assume primary index

partial cost $= 2 + \lceil \frac{480}{40} \rceil = 14$ pages