TP06

Storage and indexing

Consider relations Employees(<u>eid</u>, name, age, sal, did)

1. Suppose that relation Employees has 240124 rows. A page can store 100 rows, how many pages needed to store the table?
2. If Employees is stored in heap file, for each query below, suggest a way to retrieving the result and give an estimated I/O cost (how many pages should be read from disk to memory).
   a) SELECT * FROM employees WHERE name = 'Jeffrey Jay';
   b) SELECT * FROM employees WHERE eid = 32146;
   c) SELECT * FROM employees WHERE salary = 100 000;
   d) SELECT * FROM employees WHERE salary BETWEEN 50 000 AND 100 000 ;
   e) SELECT * FROM employees WHERE (salary BETWEEN 50 000 AND 100 000) AND did = 'd001';
   f) SELECT * FROM employees WHERE age > 25 AND age < 31 AND did ='d004' ;
3. The same question as 2., when Employees is stored in sorted file ordered by salary.
4. The same question as 2., when Employees has an index with the search key 'age', and the age of employees is in the rang of 35 to 48.
5. The same question as 2, when Employees has a hash index with the search key 'age'.
6. The same question as 2, when Employees has a hash index with the search key 'eid'
7. The same question as 2, when Employees has a b tree index with the search key 'age'.
8. The same question as 2, when Employees has a b tree index with the search key 'salary'.

Remark: @ represents rid.

Some sample data

Data file

Page1

```
@10001, Georgi Facello, 47, 88958, d005
@10002, Bezalel Simmel, 36, 72527, d007
….
@10126, Kayoko Valtorta, 46, 77310, d009
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Page2

```
@10127, Subir Baja, 48, 63100, d005
@10128, Babette Lamba, 42, 67619, d009
….
@10247, Heon Riefers, 36, 56935, d004
@10300, Sok Dara, 35, 60000, d005
@56738, Tao Zhifa, 40, 134000, d006
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…….

Page n

```
@499969, Masanao Ducloy, 40, 48797, d008
@499970, Danai Hedayat, 37, 118576, d001
….
@499999, Sachin Tsukuda, 42, 77303, d004
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Index file

Page1

```
35,@i
35,@j
….
35,@k
```

Page2

```
35,@l
35,@m
….
36,@n
36,@o
```

….

Page i

```
48,@..
48,@..
….
48,@..
48,@..
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