Assignment 3

Due: Sun 1 Nov, 23:59

Question 1 *(3 marks)*

Is it possible that deleting an entry reduces global depth by 3 in the Extendible Hashing? (Justify the reasons of your answer)

Question 2 *(3 marks)*

Consider a relation R(a,b,c,d,e) containing 5,000,000 records, where each data page of the relation holds 10 records. R is organized as a sorted file with the search key R.a. Assume that R.a is a candidate key of R, with values lying in the range 0 to 4,999,999. For the relational algebra $\pi_{a,b}(\sigma_{a>50,000}(R))$, state which of the following approaches (or combination thereof) is most likely to be the cheapest:

1. Access the sorted file for R directly.
2. Use a clustered B+ tree index on attribute R.a.
3. Use a linear hashed index on attribute R.a.
4. Use a clustered B+ tree index on attributes (R.a,R.b).
5. Use a linear hashed index on attributes (R.a,R.b).
6. Use an unclustered B+ tree index on attribute R.b.

Question 3 *(4 marks)*

Given the following schedule: S: R1(X), W1(Y), R2(Y), W2(Z), R3(Z), W3(X) of three transactions. Here, R1(X) indicates a read operations in transaction T1 on a variable X. Regarding the following two questions, give and justify your answers:

1. Is this schedule *conflict-serializable*? Draw the schedule graph to justify your answer.
2. List all the possible serial schedules of the three transactions such that they are conflict-equivalent to S.

Assignment Submission

We accept electronic submissions only. Please submit your assignments as follows:

- Ensure that you are in the directory containing the file to be submitted. (note: we only accept files with .pdf extension)
- Type “give cs9311 ass3 ass3.pdf”

Note

1. We do not accept e-mail submissions, and the submission system will be immediately closed after the deadline.
2. If the size of your pdf file is larger than 2MB, the system will not accept the submission. If you face this problem, try converting to compressed pdf.
3. If you have any problems in submissions, please email to

xiangw@cse.unsw.edu.au.

Late Submission Penalty

Zero mark