The University of New South Wales

COMP9315 DBMS Implementation Final Exam 14s2

Question 7 (8 marks)

Consider a relation `R(a,b,c)` implemented as a *multi-attribute hashed* file, with the following properties:

- the file has b = 256 pages, so the least significant 8-bits of the hash values are used
- choice vector: (bit 0 is the least significant bit)
  - bit 0 in the tuple hash comes from bit 0 of the hash of attribute `a`
  - bit 1 in the tuple hash comes from bit 0 of the hash of attribute `b`
  - bit 2 in the tuple hash comes from bit 0 of the hash of attribute `c`
  - bit 3 in the tuple hash comes from bit 1 of the hash of attribute `a`
  - bit 4 in the tuple hash comes from bit 2 of the hash of attribute `a`
  - bit 5 in the tuple hash comes from bit 1 of the hash of attribute `b`
  - bit 6 in the tuple hash comes from bit 1 of the hash of attribute `c`
  - bit 7 in the tuple hash comes from bit 3 of the hash of attribute `a`
- query distribution:
  - Q_1: `select * from R where a = k`, $P_{Q_1} = 0.3$
  - Q_2: `select * from R where b = j`, $P_{Q_2} = 0.2$
  - Q_3: `select * from R where a = k and b = j`, $P_{Q_3} = 0.2$
  - Q_4: `select * from R where b = j and c = m`, $P_{Q_4} = 0.1$
  - Q_5: `select * from R where a = k and c = m`, $P_{Q_5} = 0.2$

  where k, j and m are constants of the appropriate type

Based on the above, answer the following:

a. How many pages are accessed in answering queries of type Q_1?

b. How many pages are accessed in answering queries of type Q_2?

c. How many pages are accessed in answering queries of type Q_3?

d. How many pages are accessed in answering queries of type Q_4?

e. How many pages are accessed in answering queries of type Q_5?

f. What is the weighted average cost of answering a query on this relation?

Instructions:

- Type your answer to this question into the file called `q7.txt`
- Submit via: **`submit q7`**

End of Question