Database Management System 25

Numerical on Indexing

Chittaranjan Pradhan
School of Computer Engineering,
KIIT University

Numerical on Indexing

Primary Indexes

- Number of Records=N, Block size=B Bytes, Record size=R Bytes, Key size=K Bytes, Pointer size=P Bytes
- Data records per block (Blocking factor)= Floor(Block size/Record size)= Floor(B/R)
- Number of Blocks required (n)= Ceil(N/Blocking factor)
- Without index, number of block access to find a record = Ceil($log_2 n$)
- With index
  - Index size (I)=K+P
  - Index records per block(i)= Floor(B/I)
  - Total number of index entries = Total number of blocks
  - Number of Index blocks(m)=Ceil(n/i)
  - Average number of Block access = Ceil($log_2 m$)+1
- Ex: Number of Records= 30000, Block size=1024 Bytes, Record size=100 Bytes, Key size= 6 Bytes, Pointer size=9 Bytes

Numerical on Indexing...

Secondary Indexes

- Number of Records=N, Block size=B Bytes, Record size=R Bytes, Key size=K Bytes, Pointer size=P Bytes
- Data records per block (Blocking factor)= Floor(Block size/Record size)= Floor(B/R)
- Number of Blocks required (n)= Ceil(N/Blocking factor)
- Without index, number of block access to find a record (worst case) = n
- With index
  - Index size (I)=K+P
  - Index records per block(i)= Floor(B/I)
  - Total number of index entries = Total number of records
  - Number of Index blocks(m)=Ceil(N/i)
  - Average number of Block access = Ceil($log_2 m$)+1
- Ex: Number of Records= 30000, Block size=1024 Bytes, Record size=100 Bytes, Key size= 6 Bytes, Pointer size=9 Bytes

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Multilevel Indexes

- Number of Records=N, Block size=B Bytes, Record size=R Bytes, Key size=K Bytes, Pointer size=P Bytes
- Data records per block (Blocking factor)= Floor(Block size/Record size)= Floor(B/R)
- Number of Blocks required (n)= Ceil(N/Blocking factor)
- Number of Bytes in each index entry (I)=K+P
- Index records per block (i)=Floor(B/I)
- Number of Index Blocks required (m)= Ceil(n/i) for First Level
- Second Level Index
  - Number of records = Number of blocks of first level index(m)
  - Number of blocks required (q)= Ceil(m/i)
- The steps will be repeated upto the number of index block required is 1
- Block access required for a record = index level + 1
- Ex: Number of Records= 30000, Block size=1024 Bytes, Record size=100 Bytes, Key size= 6 Bytes, Pointer size=9