

# CS 245: Database System Principles

## Review Session 1

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## Tentative Syllabus 2009

DATE	CHAPTER [2nd Ed]	TOPIC
• Wednesday June 24	Ch. 11 [13]	Introduction / Hardware
• Monday June 29	Ch. 12 [13]	File and System Structure
• Wednesday July 1	Ch. 12 [13]	File and System Structure
• Monday July 6	Ch. 13 [14]	Indexing and Hashing
• Wednesday July 8	Ch. 13 [14]	Indexing and Hashing
• Monday July 13	Ch. 15 [15]	Query Processing
• Wednesday July 15	Ch. 16 [16]	Query Processing
• Monday July 20		<b>MIDTERM</b>
• Wednesday July 22	Ch. 17 [17]	Crash Recovery
• Monday July 27	Ch. 17 [17]	Crash Recovery
• Wednesday July 29	Ch. 18 [18]	Concurrency Control
• Monday August 3	Ch. 18 [18]	Concurrency Control
• Wednesday August 5	Ch. 19 [19]	Transaction Processing
• Monday August 10	Ch. 20 [21,22]	Information Integration
• Wednesday August 12		Review
• Friday August 14, 8:30-11:30am		<b>FINAL EXAM</b>

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### Hardware

- Disk access times
- Optimizations
- Other topics
  - Using secondary storage
  - Disk failures

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### File & System Structure

- Record format
- Storing record in blocks
- Other topics
  - Insertion/deletion
  - Buffer management

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### Indexing and Hashing

- Indexing
  - Conventional indexes
  - B+ trees
- Hashing
  - Dynamic hashing
- Multiple key indexing

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### Query Processing

- Relational algebra level
  - Transformations
  - Good transformations
- Detailed query plan level
  - Estimate costs
  - Generate and compare plans

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### Additional Problem 1

Linear Hashing

3 records/bucket

If utilization > 2, allocate bucket

Insert keys: 00010,00011,00101,00111,  
01011,10001,10011,10111,11101,11111

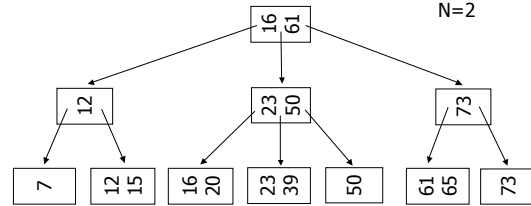
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### Additional Problem 2

N=2



Insert 19

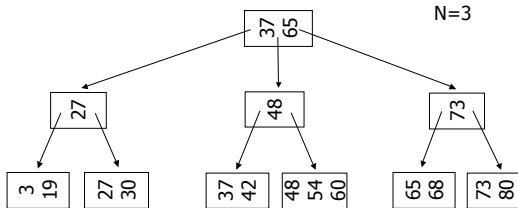
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### Additional Problem 3

N=3



Delete 30

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### Additional Problem 4

True or False? (assume SUM semantics)

- $R \cup R = R$
- $R \cap R = R$
- $R - R = \emptyset$
- $R \cup (S \cap T) = (R \cup S) \cap (R \cup T)$

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### Additional Problem 5

$R(A,B,C)$ ,  $S(C,D,E)$ ,  $T(E,F)$

Primary Keys:  $R(C)$ ,  $S(C)$ ,  $S(E)$ ,  $T(E)$

$T(R)=1000$ ,  $T(S) = 1500$ ,  $T(T) = 750$

- Size of  $R \bowtie S \bowtie T$
- Best join order (smallest intermediate result)

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