2020-2021

5COSC002W DATABASE SYSTEMS

Lecture 04

LOGICAL DATABASE DESIGN

Mapping a large conceptual ER model to a logical ER model

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Lecture 04 – Outline

- Step-by-step approach to map conceptual ERD to a logical ERD
  1) *Mapping rules considered 'disruptive'*
  2) *Mapping rules for 'complex relationships'*
  3) *Mapping rules for 'complex relationships'*

- Practical exercise: map a LARGE conceptual ERD to a logical ERD

See "Lecture 05 Practical Exercise Sheet"

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Mapping LARGE Conceptual ERDs to Logical ERDS: step-by-step approach

(For the mapping rules, refer to Lecture 03)

STEP1

Start with the mapping rules that are very 'disruptive'

- **Map the GENERALISATIONS** *(see rule 7,8, 9, 10)*

  → **3 entities can either become 1, 2 or 3 tables**

- **Map the 1:1 RSHIPS MANDATORY ON BOTH SIDES** *(see rule 2)*

  → **2 entities are merged into 1 table**

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Mapping LARGE Conceptual ERDs to Logical ERDS: step-by-step approach

(For the mapping rules, refer to Lecture 03)

STEP2

Use the mapping rules for 'complex relationships'

- **Map the TERNARY RSHIPS** *(see rule 6)*

  → **3 entities become 4 tables**

- **Map the M:M RSHIPS** *(see rule 5)*

  → **2 entities become 3 tables**

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Mapping LARGE Conceptual ERDs to Logical ERDS: step-by-step approach

(For the mapping rules, refer to Lecture 03)

STEP3

Use the mapping rules for 'simple relationships'

- **Map the 1:1 RSHIPS OPTIONAL ON ONE SIDE and OPTIONAL ON BOTH SIDES** *(see rule 3 & 4)*

  → 2 entities become 2 tables, FK on child table

- **Map the 1:M RSHIPS** *(see rule 1)*

  → 2 entities become 2 tables, FK on child table

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Practical Exercise: Map conceptual ERD to logical ERD

- Access the “Lecture 04 – Logical Mapping Exercise” document on Blackboard
- Use the step-by-step method presented in this lecture to map the conceptual ERD to a logical ERD