

COMP9120 Relational Database Systems**Tutorial Week 13: Revision****Tell us what you think**

Please spend some time to complete the COMP9120 Unit of Study Survey (USS) survey found here: <https://student-surveys.sydney.edu.au>

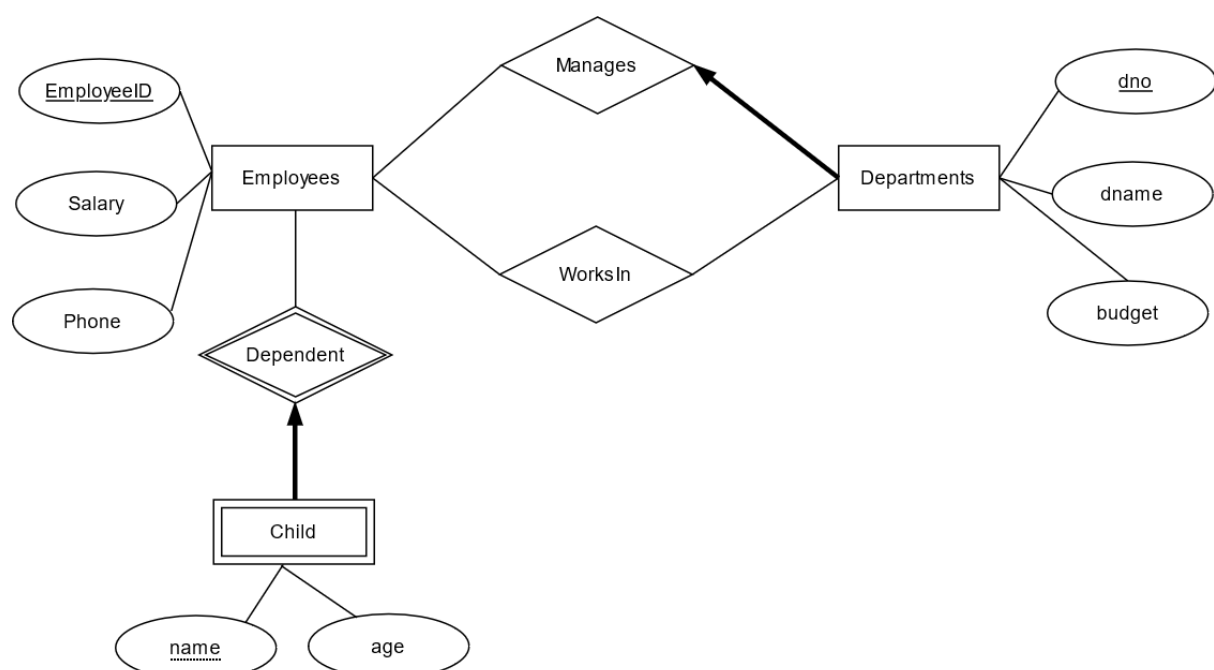
Any feedback you can give on the course is helpful. Please be specific about anything you think was good or bad about the course, and if you want to mention your tutor, remember to mention them by name. Your responses will be anonymous, and any feedback you can give (positive or negative) will help us in making the course better for future.

Q1: Drawing ER diagram

A company database needs to store information about employees (identified by employeeID, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes).

Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company.

Draw an ER diagram that captures this information.

Solution:

Q2: Normalization

Suppose you are given a relation R with four attributes ABCD. For the given sets of FDs,

$A \rightarrow B$,

$BC \rightarrow D$,

$A \rightarrow C$

do the following:

- (a) Identify the candidate key(s) for R.
- (b) Identify the best normal form that R satisfies (1NF, 2NF, 3NF, or BCNF).
- (c) If R is not in BCNF, decompose it into a set of BCNF relations that preserve the dependencies.

Solution:

- a) Candidate key: A
- b) R is in 2NF but not 3NF (because of the FD: $BC \rightarrow D$).
- c) $BC \rightarrow D$ violates BCNF since BC does not contain a key. So, we split up R as in: BCD, ABC.