

Tutorial B01: Entity Relationship Diagram (ERD)

- Q1 Draw an ERD using the entity relationship diagramming technique.
- (a) Employee Number identifies an **employee**. Employee name is kept.
 - (b) Each **customer** has a unique customer number. The name and address of the customer must be kept.
 - (c) An employee is assigned to **one or more** customers. **Not all** employees are assigned to customers.
 - (d) A customer must be assigned to **only one employee**.
- Q2. Draw an ERD using the entity relationship diagramming technique.
- (a) A customer must order at least one product.
 - (b) A product may be ordered by many customers. Some products are not ordered by any customers.
 - (c) A customer has a unique customer number, name and email.
 - (d) A product has a unique product code, description and unit price.
 - (e) The date ordered and the quantity ordered by the customer for each product must be kept.
- Q3. Draw an ERD to present the following description.
- (a) Employee supervises other employees.
 - (b) Not all employees supervise other employees.
 - (c) An employee is supervised by only one employee.
 - (d) The employee who owns the company has no supervisor.
 - (e) An employee is identified by an employee number.

Q4. Construct a Conceptual Data Model based on a given business description using the entity relationship diagramming (ERD) techniques. (Note: to facilitate class discussion, the description is rewritten with alphabetical numbering.) You are not required to include non-key attributes for the entity types.

- (1) Working Lifts is a company that specializes in lift maintenance and servicing.
- (2) Its' main business is the servicing of lifts in commercial buildings.
- (3) Working Lifts identifies each **building** by the building's name.
- (4) The address and number of floors of the building are kept.
- (5) The **lifts** within a building have a lift number that is unique only within that building.
- (6) The model number of the lift and the date installed is kept for each lift.
- (7) A maintenance job is carried out for each maintenance of a lift.
- (8) The **maintenance** job has a unique job number.
- (9) The date and time of the maintenance must be kept for each job.
- (10) A lift has one or many maintenance jobs.
- (11) Each maintenance job is done on one lift only.
- (12) There are two types of maintenance jobs: **Regular and Ad-hoc.**
- (13) Regular maintenance is carried out at pre-determined dates.
- (14) The date of the next maintenance is kept for regular maintenance.
- (15) Ad-hoc maintenance is carried out as and when the lift breaks down.
- (16) The amount charged for each Ad-hoc maintenance must be kept.
- (17) At times, during regular maintenance, an Ad-hoc maintenance may be carried out if problems are detected in the lift.
- (18) Working Lifts keeps track of all problems that have occurred in the lifts.
- (19) A **problem** has a unique problem number.
- (20) The description of the problem and the recommended action to be taken are kept for each problem.
- (21) The company tracks the problems that are found in each Ad-hoc maintenance job. An Ad-hoc maintenance job can rectify more than one problem.
- (22) The same problem may occur across different Ad-hoc maintenance jobs.
- (23) Employees in the company may be assigned to the maintenance job.
- (24) Each employee may be assigned to more than one maintenance jobs.
- (25) A maintenance job is carried out by more than one employee.
- (26) An **employee** has a unique employee number.
- (27) The company also keeps the employee's name and address.