

Entity Relationship Diagram Exercises

For each of the following narratives, draw an ERD diagram which indicates the entities and their attributes (if given). Identify and label significant relationships between pairs of entities.

Exercise 1

Pick and Shovel Construction Company is a multi-state building contractor specializing in medium-priced town homes. Assume that Pick and Shovel's main entities are its customers, employees, projects and equipment. A customer can hire the company for more than one project, and employees sometimes work on more than one project at a time. Equipment, however, is assigned to only one project at a time. Draw an ERD showing those entities. [solution](#)

Exercise 2

A hardware store sells several home workshop products to the public (such as power saws and sanders). Each product has several different manufacturers who manufacture it, and prices are different for products made by different manufacturers. Each time one or more products are sold to a customer, an invoice is created which lists the date, items purchased and their prices, and then the total purchase and tax amounts.

Exercise 3

The Ministry of Transportation (MOT) supplies department keeps track of all the items (furniture and equipment such as a chair or printer) in the Ministry offices. There are several MOT buildings and each one is given a different name to identify it. Each item is assigned a unique ID when it is purchased. This ID is used to keep track of the item, which is assigned to a room within a building. Each room within a building is assigned to a department, and each department has a single employee as its manager.

Exercise 4

A cooking club organizes several dinners for its members. The purpose of the club is to allow several members to get together and prepare a dinner for the other members. The club president maintains a database that plans each meal and tracks which members attend each dinner, and also keeps track of which members create each dinner.

Each dinner serves many members and any member is allowed to attend. Each dinner has an invitation. This invitation is mailed to each member. The invitation includes the date of the dinner and location.

Each dinner is based on a single entrée and a single dessert. This entrée and dessert can be used again for other dinners.

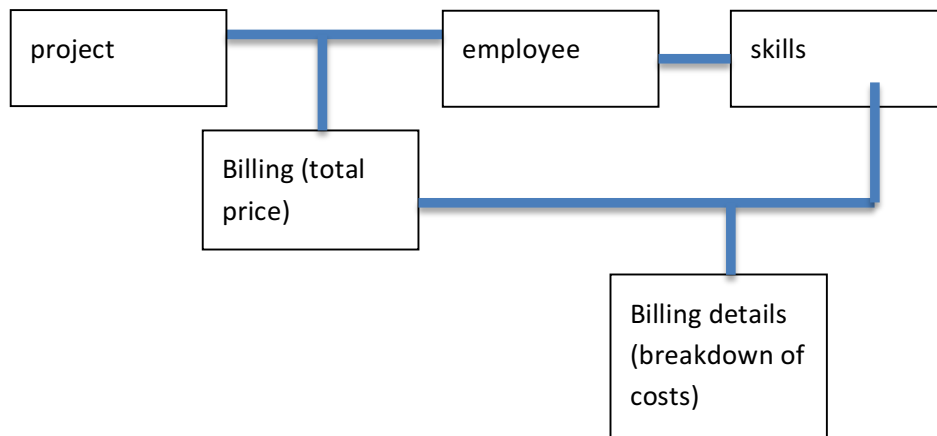
More exercises:

5. Patty's Playschool is a child daycare centre. A parent registers their child or children at the school using a registration form. A parent can submit more than one registration form. Each room in the daycare is assigned an age group. For example an infant is under 1 year of age and toddlers are from 1 to 3 years of age. A child is assigned to a room based on their age and availability of space. A room may be assigned one or more employees. An employee can only be assigned to one room. The minimum number of employees required for a room is determined by the number of children assigned to the room and the child:staff ratio identified by the government. For example one employee can care for 5 infants or 8 toddlers.

6. FastFlight Airlines is a small air carrier operating in three north-eastern states. FastFlight is in the process of computerizing its passenger reservation system. The following data items have been identified: reservation code, flight number, flight date, origin, destination, departure time, arrival time, passenger name, seat number, reservation agent number and reservation agent name. For example, flight number 303, which is scheduled every Tuesday and Thursday, leaves Augusta, Maine, at 9:23am and arrives in Nashua, New Hampshire at 10:17am. You can assume that the Fast Freight reservation system will detect automatically whether empty seats are available. Draw the Entity Relationship Diagram for this system.

7. ABC Consulting is a small-sized consulting firm in the IT industry. ABC's business is managing several Systems Development projects by assigning staff consultants to these projects as their skills are needed. Each employee is designated to have one primary skill, but there may be other employees with the same primary skill. A consultant may work on one or more projects, or may not yet be assigned to a project.

The company charges for each project by billing each consultant's hours worked by the billing rate. The hourly billing rate is dependant on the employee's primary job skill.



8. A company operates a warehouse parts supply business. The company has several warehouses located in Europe which each store several hundreds of automotive parts. We need to keep a record of how many parts are "on hand" - meaning inventory levels that tell us how many we have for each part. To help us organize our parts, each part is assigned a specific classification. There are 4 classifications that we use to organize hundreds of parts.

9. To keep track of office furniture, computers, printers, and so on, the FOUNDIT company requires the creation of a simple database. Each piece of office furniture, computer or printer is given an identification number. Each item is then placed in a room of one of three buildings. The building manager is responsible for the items in their building.