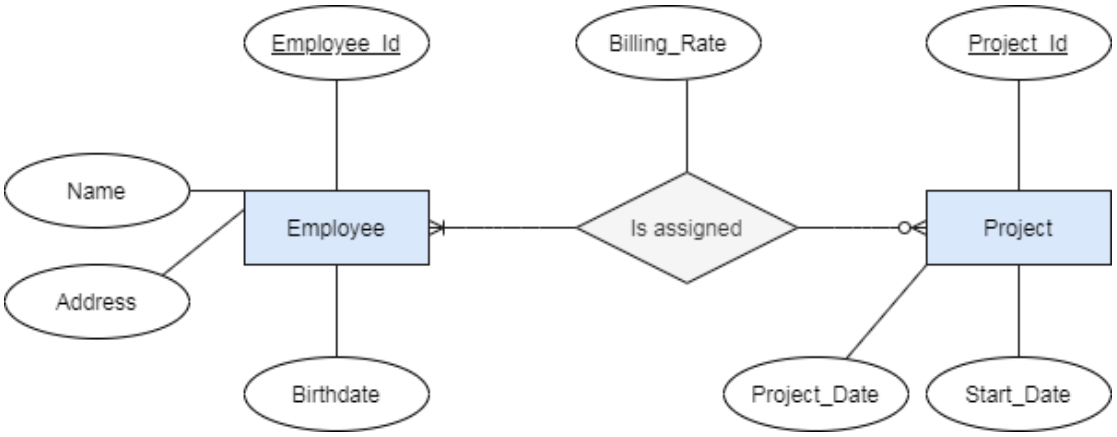
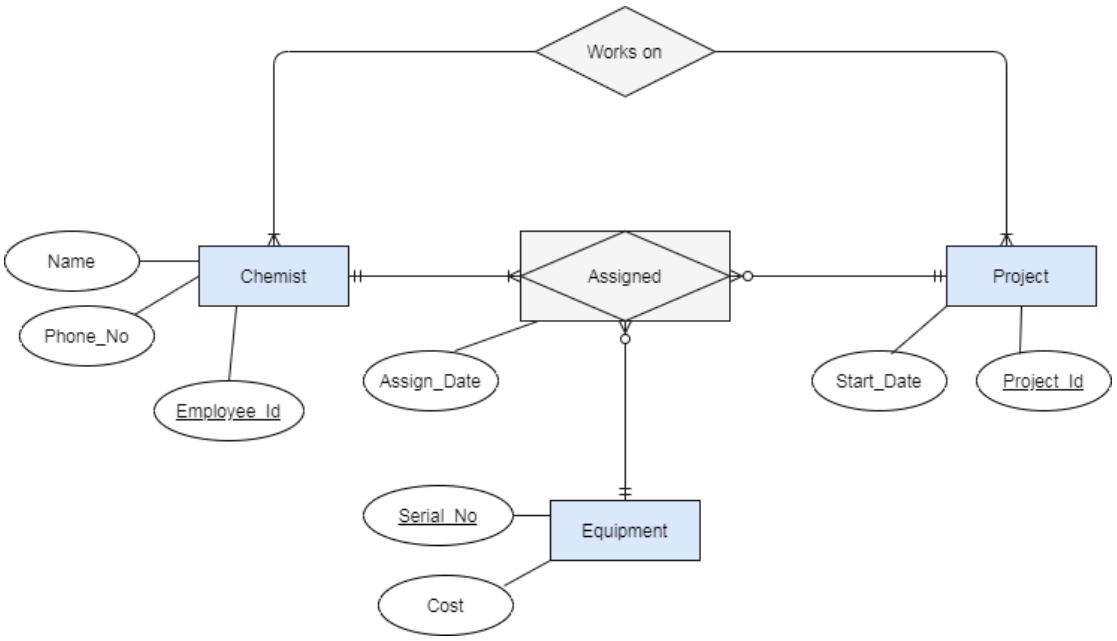
Chapter 2: Modeling Data in the Organization

Draw an ERD for each of the following situations. (If you believe that you need to make additional assumptions, clearly state them for each situation.) Draw the same situation using the tool you have been told to use in the course. (PG.104)

a. A company has a number of employees. The attributes of EMPLOYEE include Employee ID (identifier), Name, Address, and Birthdate. The company also has several projects. Attributes of PROJECT include Project ID (identifier), Project Name, and Start Date. Each employee may be assigned to one or more projects, or may not be assigned to a project. A project must have at least one employee assigned and may have any number of employees assigned. An employee's billing rate may vary by project, and the company wishes to record the applicable billing rate (Billing Rate) for each employee when assigned to a particular project. Do the attribute names in this description follow the guidelines for naming attributes? If not, suggest better names. Do you have any associative entities on your ERD? If so, what are the identifiers for those associative entities? Does your ERD allow a project to be created before it has any employees assigned to it? Explain. How would you change your ERD if the Billing Rate could change in the middle of a project?



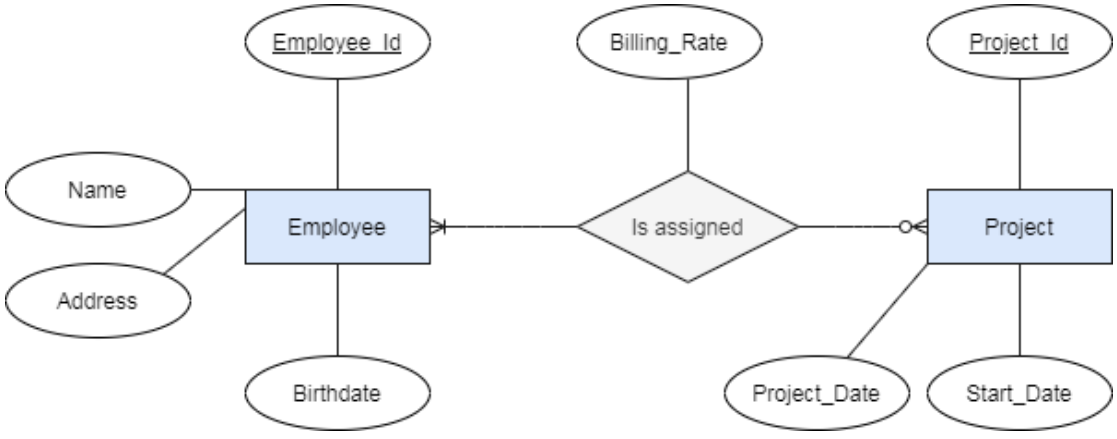
b. A laboratory has several chemists who work on one or more projects. Chemists also may use certain kinds of equipment on each project. Attributes of CHEMIST include Employee ID (identifier), Name, and Phone No. Attributes of PROJECT include Project ID (identifier) and Start Date. Attributes of EQUIPMENT include Serial No and Cost. The organization wishes to record Assign Date that is, the date when a given equipment item was assigned to a particular chemist working on a specified project. A chemist must be assigned to at least one project and one equipment item. A given equipment item need not be assigned, and a given project need not be assigned either a chemist or an equipment item. Provide good definitions for all of the relationships in this situation



All three entities participate in an assignment. However, EQUIPMENT and PROJECT do not need to participate in any assignments. All entities can have multiple assignments.

(Works On) relationship was created to show what projects a chemist works on. In the case where no equipment is used for a project, there would be no way of showing an assignment using the Assigned relationship.

c. A college course may have one or more scheduled sections, or may not have a scheduled section. Attributes of COURSE include Course ID, Course Name, and Units. Attributes of SECTION include Section Number and Semester ID. Semester ID is composed of two parts: Semester and Year. Section Number is an integer (such as 1 or 2) that distinguishes one section from another for the same course but does not uniquely identify a section. How did you model SECTION? Why did you choose this way versus alternative ways to model SECTION?



Section was modeled as a weak entity. It could have been modeled as a multi-valued attribute of course, however, this model allows a section of a course to have a relationship with another entity (think instructor or student)…the multi-valued attribute case would not allow this relationship.