BCIS4620 Homework Assignment 2

In this assignment, you are required to complete these **two** tasks:
1. Complete the following ERD cases (see next page). You **must** use a CASE tool to create the ERDs.
2. Complete Chapter 6 Problem #7 (textbook page 238-239).

ERD requirements:
In your ERD*, you must include:
- All entities and the relationships among them;
- Reasonable attributes for each entity;
- Notations of all PKs and FKs
- Cardinalities for each relationship

*You can refer to the textbook Figure 4.35 on page 144 for an example of a completed ERD.

Due date is listed in Canvas

ERD Cases:
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.

1. 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.

2. 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.

3. 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.

4. A hospital has a large number of registered physicians. Attributes of PHYSICIAN include Physician ID (the identifier) and Specialty. Patients are admitted to the hospital by physicians. Attributes of PATIENT include Patient ID (the identifier) and Patient Name. Any patient who is admitted must have exactly one admitting physician. A physician may optionally admit any number of patients. Once admitted, a given patient must be treated by at least one physician. A particular physician may treat any number of patients, or may not treat any patients. Whenever a patient is treated by a physician, the hospital wishes to record the details of the treatment (Treatment Detail). Components of Treatment Detail include Date, Time, and Results.

5. The loan office in a bank receives from various parties requests to investigate the credit status of a customer. Each credit request is identified by a Request ID and is described by a Request Date and Requesting Party Name. The loan office also received results of credit checks. A credit check is identified by a Credit Check ID and is described by the Credit Check Date and the Credit Rating. The loan office matches credit requests with credit check results. A credit request may be recorded before its result arrives; a particular credit result may be used in support of several credit requests.

6. An art museum owns a large volume of works of art. Each work of art is described by an item code (identifier), title, type, and size; size is further composed of height, width, and weight. A work of art is developed by an artist, but the artist for some works is unknown. An artist is described by an artist ID (identifier), name, date of birth, and date of death (which is null for still living artists). Only data about artists for works currently owned by the museum are kept in the database. At any point in time, a work of art is either on display at the museum, held in storage, away from the museum as part of a traveling show, or on loan to another gallery. If on display at the museum, a work of art is also described by its location within the museum. A traveling show is described by a show ID (identifier), the city in which the show is currently appearing, and the start and end dates of the show. Many of the museum works may be part of a given show, and only active shows with at least one museum work of art need be represented in the database. Finally, another gallery is described by a gallery ID (identifier), name, and city. The museum wants to retain a complete history of loaning a work of art to other galleries, and each time a work is loaned, the museum wants to know the date the work was loaned and the date it was returned.

7. Each case handled by the law firm of Dewey, Cheetim, and Howe has a unique case number; a date opened, date closed, and judgment description are also kept on each case. A case is brought by one or more plaintiffs, and the same plaintiff may be involved in many cases. A plaintiff has a requested judgment characteristic. A case is against one or more defendants, and the same defendant may be involved in many cases. A plaintiff or defendant may be a person or an organization. Over time, the same person or organization may be a defendant or a plaintiff in cases. In either situation, such legal entities are identified by an entity number, and other attributes are name and net worth.

8. Each publisher has a unique name; a mailing address and telephone number are also kept on each publisher. A publisher publishes one or more books; a book is published by exactly one publisher. A book is identified by its ISBN, and other attributes are title, price, and number of pages. Each book is written by one or more authors; an author writes one or more books, potentially for different publishers. Each author is uniquely described by an author ID, and we know each author's name and address. Each author is paid a certain royalty rate on each book he or she authors, which potentially varies for each book and for each author. An author receives a separate royalty check for each book he or she writes. Each check is identified by its check number, and we also keep track of the date and amount of each check.