Project, Phase 3
CS 4347
Fall 2023
Due: November 2nd, 11:59 pm

Objective:

To continue through to the design aspect of construction a database for the Database Class. The goal of the project is to build the database, not the database application. To that end, certain phases must be completed. This phase consists of

- Design Update
- Software Discovery
- Implementation Log
- Table Listing of the Database

Phase 2 Design Update (20 Points)

By this stage, the ER diagram, ER Dictionary, Schema Diagram, and Schema Dictionary will be used as reference to write the actual database. The latest version of this material should be included as a document in your phase three turn-in. By now, your design has gone through multiple revisions, so there may not be any major changes. This design submitted by the cohort must match the database implementation.

- New material that has had to be added to the design should be marked in blue and bolded. (**#0000FF**)
- Material that has been removed from the design should be marked in black, bolded, and struck through. (**~~#000000~~**)
- Everything implemented should be in standard black and not bolded. (#000000)

But this time, the Design will be used to create the database. *This design must match what is being implemented.* If your database does not match your design, points will be deducted for each mismatch.

The Software Discovery (20 Points)

Now, your Cohort must choose what form of Database Management System software to continue the project. Instead of a drawing program or tool to create the diagrams, it is time to get the actual SQL based system online.

Such a system could be MySQL, or Microsoft Access, Heidi SQL/Maria DB or any other form of readily and freely available software package. Some systems are 100% text, others are 100% graphical, and some are a mixture. Your cohort will have to document this system for the project.

What the Cohort needs to show:

Software Discovery is meticulous this time. Software Discovery must contain the following:

- The DBMS system must be named, and its origin clearly specified as a cited work.

- Specifically, state ***WHY*** the Cohort chose this software. This should not be a one-word or one-sentence reply. Give some thought and write an adequate reason the software was chosen. This must include a critique: Using a system, whether text or graphical, requires some self-teaching or training time. And this can be very annoying. Not every system is smooth and user friendly. If you are asking how long this portion should be, you are not thinking this through. If you are stuck on writing this portion, start by listing out three advantages and three disadvantages for the software.

- Include a Screen Capture of the work area. The work area could be web, graphical, or even text based.

- The software discovery must include descriptions of how the chosen DBMS performs the six standard operations. If necessary, include a listing of the relevant menu, or screen captures to illustrate that the system works. Include a title or caption that clearly identifies what the operation is. Yes, the Cohort can cite the relevant help pages or wiki that goes with the tool. If the commands of the discovered software and the standard operations of relational database are one-for-one, so much the better.
    - CREATE TABLE
    - DROP TABLE
    - SELECT TUPLES
    - INSERT TUPLES
    - DELETE TUPLES
    - UPDATE TUPLES

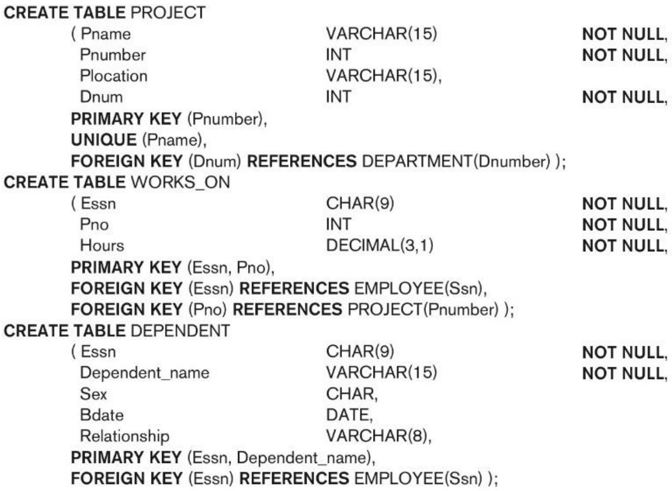
- Recommended, but not required, databases have SHOW and DESCRIBE commands. These commands are like directory listings. SHOW Tables can list out all the active tables. A DESCRIBE command can show the format of the tables. Check the instructions for your software before doing deep-diving searches on the internet.

Implementation Log (30 Points)

When constructing the Database, depending on the software, different methods occur. Some systems use an interactive set of dialog boxes to set up each table. Others have a point and click where the table is typed into a graphic. Others use the classic SQL creation script. The implementation log might be the script that creates the tables in the database.

Depending on the software selected, the appearance of this type of activity would be different. For example, a system with a command window and a flat command line interface would be able to take a script of SQL. Other systems, a user must sit down in front of a screen and manipulate one table at a time.

For the implementation log, document what was done.
For a flat SQL, include the script of the commands like what was shown in this text.



```
CREATE TABLE PROJECT
        ( Pname                     VARCHAR(15)              NOT NULL,
          Pnumber                   INT                      NOT NULL,
          Plocation                 VARCHAR(15),
          Dnum                      INT                      NOT NULL,
        PRIMARY KEY (Pnumber),
        UNIQUE (Pname),
        FOREIGN KEY (Dnum) REFERENCES DEPARTMENT(Dnumber) );
CREATE TABLE WORKS_ON
        ( Essn                      CHAR(9)                  NOT NULL,
          Pno                       INT                      NOT NULL,
          Hours                     DECIMAL(3,1)             NOT NULL,
        PRIMARY KEY (Essn, Pno),
        FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn),
        FOREIGN KEY (Pno) REFERENCES PROJECT(Pnumber) );
CREATE TABLE DEPENDENT
        ( Essn                      CHAR(9)                  NOT NULL,
          Dependent_name            VARCHAR(15)              NOT NULL,
          Sex                       CHAR,
          Bdate                     DATE,
          Relationship              VARCHAR(8),
        PRIMARY KEY (Essn, Dependent_name),
        FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn) );
```

For an interactive tool, include the date and time for the construction of each table, and a short description.

Date	Activity	Description
3.21.2023	Created Schema	Started using system for the first time.
	Created Buyer Table, Seller Table, Broker Table	Created all the people
3.24.2023	Created Stock Exchange, Stock	Created important entities
3.27.2023	Created Bank Accounts, Logs, and Transactions	Created linking tables
3.30.2023	Found errors in tables on foreign keys	Gosh, I hate debugging
4.5.2023	Everything working	After hours of clicking, schema is complete and no violations or reference errors.

Table Listing of the Database (30 points)

Once the database is complete, every DBMS has a way of generating a listing of all the tables, including, for each table:

- name,
- attributes,
- primary keys, (Sometimes coded as type PK)
- and foreign keys. (Sometimes coded as type F)

This method could be a script, such as a DESCRIBE <table name> for each table to call to recover all materials. Even if the system is a workbench or GUI based. ***Turning in the Implementation Log twice does not count!***

Example, to show the ***precioustones*** table in the database **gemstones**:

```
MariaDB [gemstones]> describe precioustones;
+-------------+-------------+------+-----+---------+----------------+
| Field       | Type        | Null | Key | Default | Extra          |
+-------------+-------------+------+-----+---------+----------------+
| PK_Precious | int(11)     | NO   | PRI | NULL    | auto_increment |
| Color       | varchar(15) | YES  |     | NULL    |                |
| Grade       | int(11)     | YES  |     | NULL    |                |
| Price       | double      | YES  |     | NULL    |                |
+-------------+-------------+------+-----+---------+----------------+
4 rows in set (0.015 sec)
```

This output can be routed to a text file, or saved as a document, or turned into a formatted listing. Create a PDF document that contains this table listing and submit the documents to blackboard.

Naming Conventions for Turn In

Turn in each of the five sections with appropriate names. Each file should be a Portable Document File (.PDF) These files should be turned in as separate files (Which can be done during one session on Blackboard)

Note: The word *Cohort* in the table below should be replaced by the name of your cohort.

Design Update	*Cohort*.DesignUpdate.pdf
Software Discovery	*Cohort*.SoftwareDiscovery.pdf
Implementation Log	*Cohort*.ImplementationLog.pdf
Table Listing	*Cohort*.TableListing.pdf

Additional:

The assignment may be turned in multiple times before the deadline.
Each student will turn in their own copy.
The assignment should not be a zip file, the files should be independent for online grading.
The grade will be for the last submission.