

# Project, Phase 2

## CS 4347

### Due October 12<sup>th</sup>, 2023

### 11:59 pm

#### Instructions:

This assignment is a Cohort Assignment. Each cohort will be doing the assignment, but each individual student must turn in their own copy.

#### 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

- Phase 1 update
- software discovery
- a Schema diagram of relational tables
- and a dictionary of keys and attributes of the schema diagram.

## Phase 1 Update: (20 Points)

During development, you and your cohort should realize that changes must be made to the Proposal, the ER Diagram, or the previous ER Dictionary. An idea, want, or need tends to appear when translating the ER diagram into a Schema. Do not scrap the ER Diagram but make any necessary modifications.

The odds that any ER diagram is perfect are extremely small, and changes are expected to be seen in Phase 2. **If no changes are present, then points will be taken off.**

Make those changes as follows:

- Anything removed should be marked with a ~~strike through~~, either as a font, table border, or old-fashioned pen and ink.
- Anything added should be colored blue, (**#0000FF**) and **bolded**.
- Original, unaltered text should remain black and normal font.

Aside: Updates to the software research portion of Phase 1 should not be necessary

This update will include the following:

- The description, even if you are just using the given example.
- What are your assumptions?
  - What are the **entities** you assume to be in your database?
  - What are the **relationships** you assume to be in your database?
  - What are the **attributes** that you assume to be in your database?
- You will have an entity-relationship diagram based on your proposal.
- The diagram must match what you have described.
- It should be “complex enough.”
- The Diagram **MUST** have
  - Every entity must have a primary key attribute.
  - Every entity must have useful information attributes.
  - Every relationship must have a cardinality.
  - A weak/owning relationship.
  - A class with subclasses
- The Entity Dictionary
  - The dictionary will be in alphabetical order by name of Entity, including subclasses.
  - Classes and Subclasses will be treated as Entities.
  - Every Entity on the diagram must be in the dictionary.
  - Every Attribute of every entity must be in the dictionary.
  - Every Entity must have a defined primary key.
- The Relation Dictionary
  - The dictionary will be in alphabetical order by name of the Relation.
  - Every Relation in the diagram must be in the dictionary.
  - Any Attributes of a Relation must be in the dictionary.
  - The Entities of the Relation must be specified.
  - The Cardinality of the Relation must be specified.

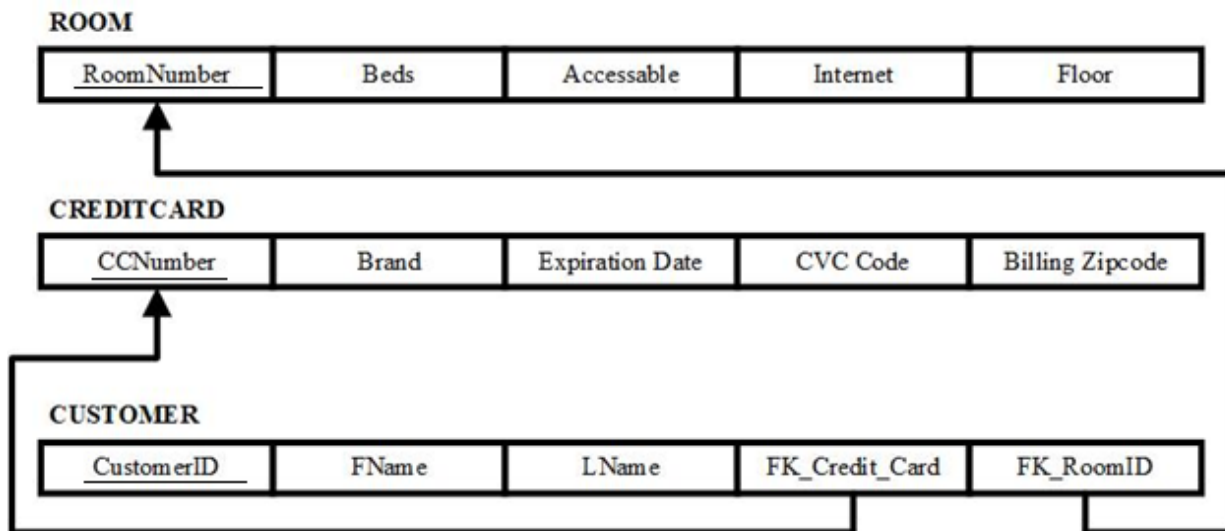
## Software Discovery (10 points)

For this project, a schema diagram must be drawn. Undoubtedly, a dozen systems exist for drawing such diagrams, just as with Phase 1. Schemas are typically table headers as a single row, and word-processing software is sometimes faster, more efficient, and just plain easier. Whether it be pencil and paper, a simple paint program, to a professional tool, to online freeware, your cohort must document what it will use, where it is from and be sure to include a screen capture. Yes, even if it is pencil and paper, then the cohort is expected to include a picture of pencil and paper.

## Schema Diagram (35 Points)

Draw the schema diagram based on the Entity-Relationship diagram from part 1 of the project. Each cohort is expected to draw the schema, with the appropriate attribute names, key designations, and linking arrows as shown in the textbook. The Relational Schema Diagram must include the reference arrows, going in the correct direction from the foreign keys back to their related primary keys. This diagram does not have Functional Dependency arrows. Be mindful of the design aspect.

The Following example is for a Hotel.



## Schema Dictionary (35 Points)

Every construct should have a dictionary entry. Each dictionary entry should include:

- **Name:** The name of the relational table
- **Description:** An *English* description of what the table does and represents
- **Attributes:** Any properties of the relational table, including its datatypes and domains
- **Primary Key:** One or more of the attributes listed above are the Primary Keys.
- **Foreign Keys:** Any keys that are based on the primary key of another relational table and include the name of that relational table.

### Example:

**Name:** Credit Card

**Description:** The person who is checking into the hotel pays with a credit card

- **CCNumber:** A 16-digit number for the credit card.
- **Brand:** Varchar(80) The brand of the credit card
- **Expiration Date:** VarChar(4), the 2-digit month and 2-digit year
- **CVC:** Int, the Card Validation Code of the credit card
- **Billing Zipcode:** Integer, the zip code of the billing address
- **Primary Key:** CCNumber

**Name:** Customer

**Description:** The person who is checking into the hotel

- **Customer ID:** Integer, an identifier for the customer
- **FName:** Varchar (80) The first name of the customer
- **LName:** Varchar(80) The last name of the customer
- **FK\_Credit\_Card:** A 16-digit number for the credit card.
- **FK\_RoomID:** integer, an integer that represents the room at the hotel.
- **Primary Key:** Customer ID
- **Foreign Key:** FK\_RoomID references Room(Room Number)
- **Foreign Key:** FK\_CreditCard references CreditCard(CCNumber)

**Name:** Room

**Description:** A Room at the hotel that a customer may rest in.

- **Room Number:** The number of the room at the hotel.
- **Beds:** int, number of beds in the room
- **Accessible:** Boolean, is the room fitted with safety features
- **Internet:** Boolean, is the room equipped with the internet.
- **Floor:** Integer, what floor of the hotel is the room.
- **Primary Key:** Room Number

## 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) If the files are not in a PDF format, the project will NOT be graded.

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

Phase 1 Update	The Proposal, ER Diagram, ER Dictionary <u><b>with all changes marked</b></u>	<i>Cohort</i> .Phase1Update.pdf
Software Discovery	What software will be used to draw the Diagrams	<i>Cohort</i> .SoftwareDiscovery.pdf
Schema Diagram	The Schema Diagram	<i>Cohort</i> .SchemaDiagram.pdf
Schema Dictionary	A full listing of the Schema	<i>Cohort</i> .SchemaDictionary.pdf

### **Additional:**

The assignment may be turned in multiple times before the deadline.

Each member will turn in their own copy.

The assignment should not be a zip file, the files should be independent for online grading.

The last submission will only be counted.