Name: Max Scharkopf Lab 2

Database Systems

NOTES: Keep all numbering intact (-10% if your number is off). Use Shift + Enter a new line without changing the order of the questions.

Part I. Get Ready (10pts)

Figure 2 represents an abstraction of Ventura Wild Routes, which is a new extreme coastal adventure outfitter based in Ventura County, California. Wild Routes specializes in unforgettable expeditions through the Channel Islands and surrounding waters. Operating from Ventura Harbor, the company offers high-speed journeys to Anacapa Island, Santa Cruz Island, and remote sea-cave systems along the rugged coastline. What sets Ventura Wild Routes apart are its night bioluminescence tours, where adventurers kayak and snorkel through glowing blue waters under moonlight, and its storm-season runs, timed to deliver raw, adrenaline-fueled encounters with towering swells, crashing surf, and dramatic coastal weather—always led by expert, safety-certified guides.

Figure 1. Ventura Wild Routes

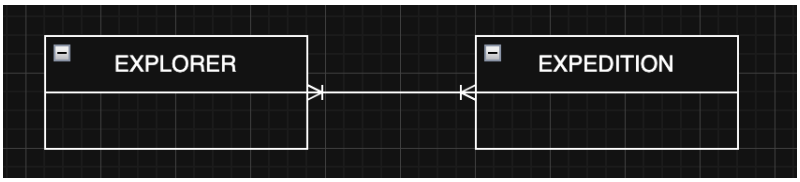


Figure 2. Explorers Seeking Expeditions

Use Draw.io to reconstruct the ERD for this charter business. Include all primary and foreign key attributes. Think creatively to construct two additional entities that relate to any of the entities below entities. When developing new entities, think about how your database system can be extended to provide additional services and store more data.

ROUTES– Stores data related to expedition routes.

EXPEDITION– Stores data related to specific trips.

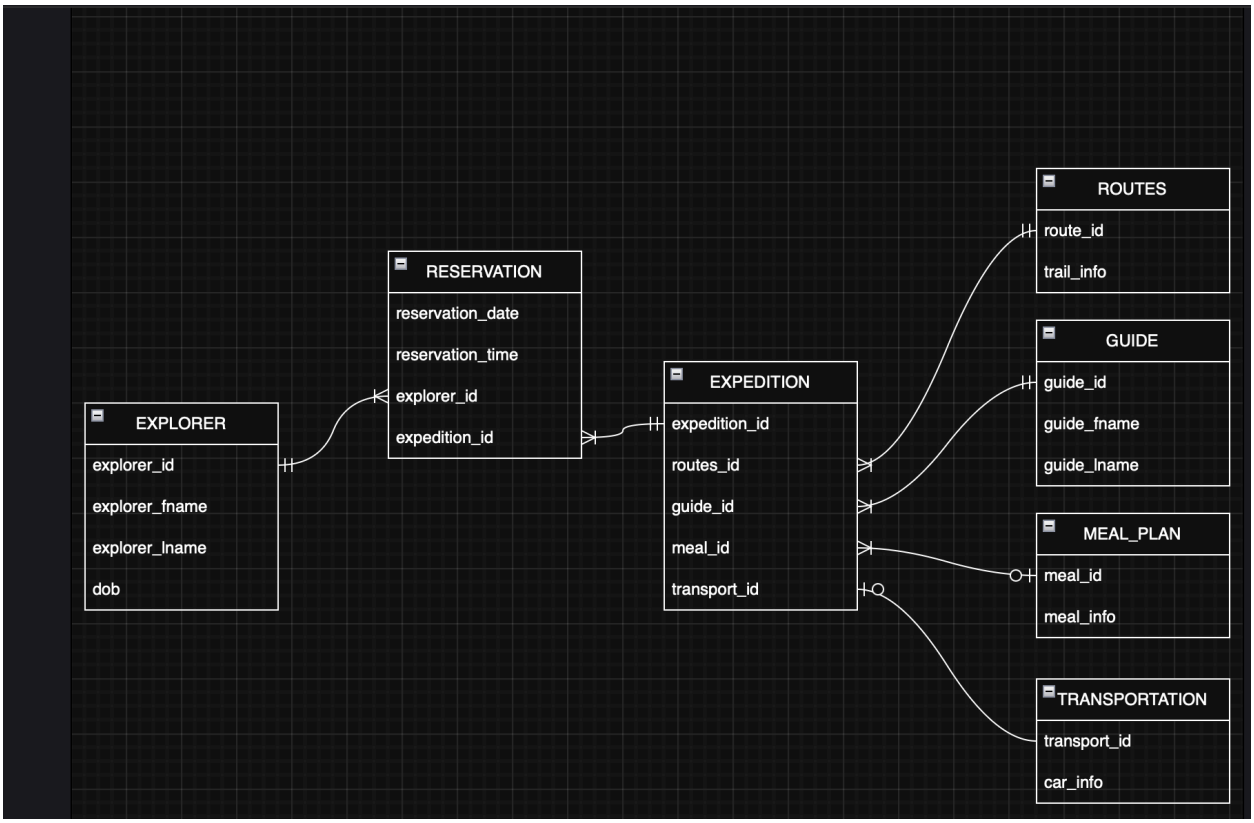
GUIDE– Stores data related to expedition guides.

EXPLORER– Stores data related to participants signing up with Wild Routes.

RESERVATION– Stores data related to explorers and the expeditions they sign up for.

MEAL_PLAN– Stores data related to expedition meal plan

TRANSPORTATION - Stores data related to expedition transportation



Part II. Get Set (10pts)

Refer to Figure 3, which maps courses to prerequisites. Answer questions 1 –10.

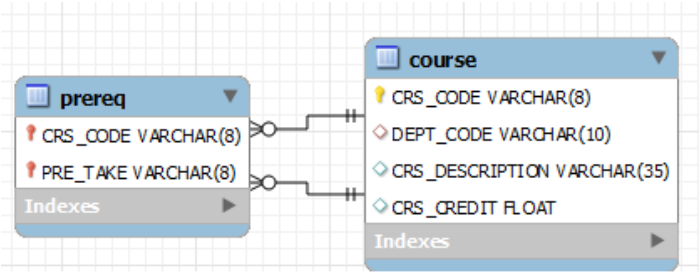


Figure 3. Course Prereq ERD

1. (T || F) ___T_PREREQ is a weak entity.
2. (T || F) ___F_COURSE is existence dependent.
3. (T || F) __F__All courses (CRS_CODE) in COURSE, have a related value (CRS_CODE) in PREREQ.
4. (T || F) __T__All prerequisite courses (CRS_CODE) in PREREQ, link with a valid course in COURSE.
5. (T || F) __F__ COURSE-to-PREREQ represents a strong relationship.
6. (T || F) __F__The minimum cardinality for COURSE-to-PREREQ is 1.
7. (T || F) __F__The primary key (i.e. unique identifier) for COURSE is (CRS_CODE, DEPT_CODE).

8. (T || F) __F__The primary key (i.e. unique identifier) for PREREQ is (CRS_CODE).

9. (T || F) _F___Foreign key data in COURSE is (PRE_TAKE).

10. (T || F) _T___PRE_TAKE data can be NULL (i.e. blank) for a corresponding CRS_CODE.

Part III. Steady now… (10pts)

Use Diagrams.net to construct ERDs for the below relationships.

Ex. CIToots is a new database that tracks undergraduate academic tutors across all majors. Only CI students may tutor subjects and a tutor my tutor multiple subjects. A single major may have multiple subjects for tutoring.

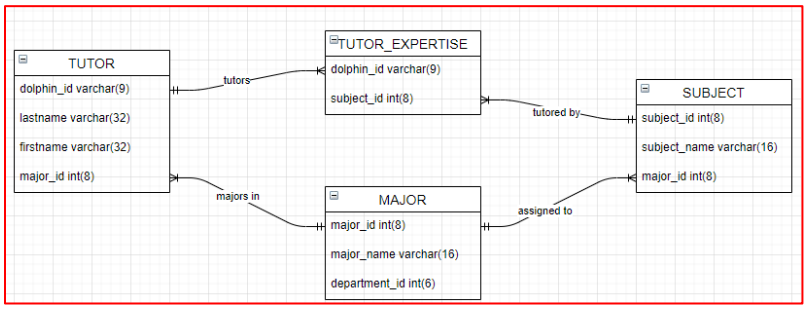
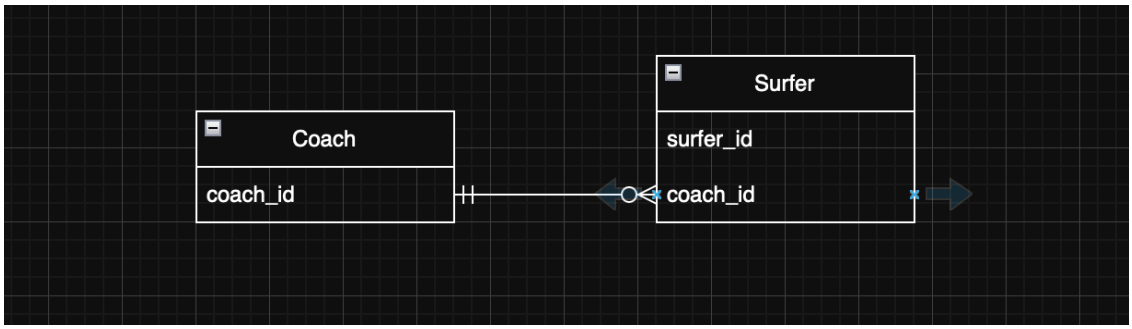
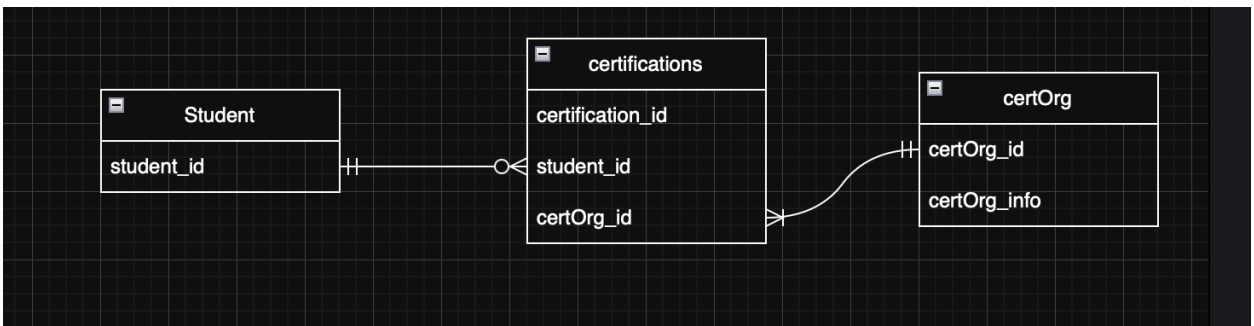


Figure 4. Example ERD Output

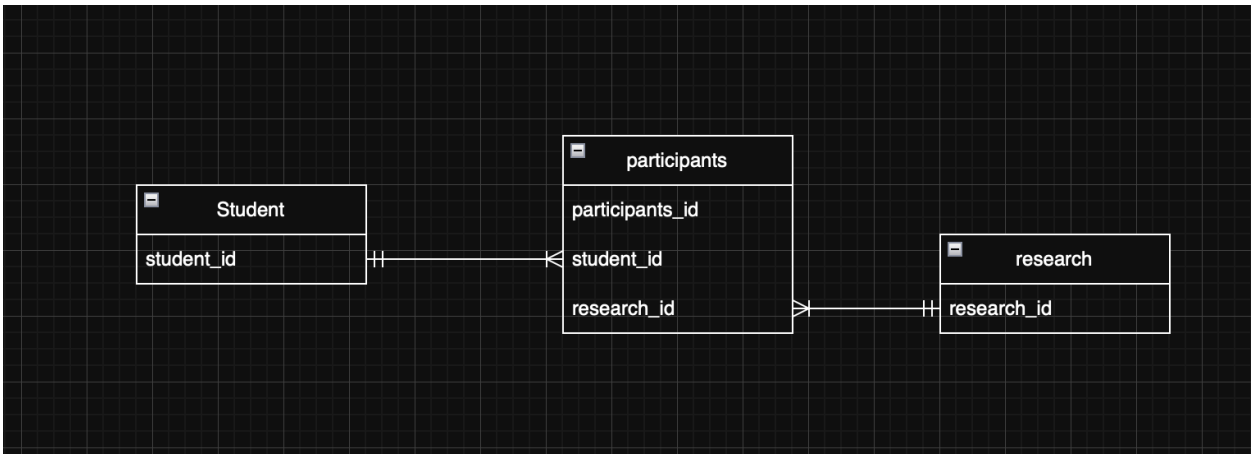
1. HarborGuides is a new database to help track surf safety coaching in Ventura County. One certified coach may train many surfers, but each surfer may be assigned to only one coach at a time. Construct the ERD for this database. (2pts)



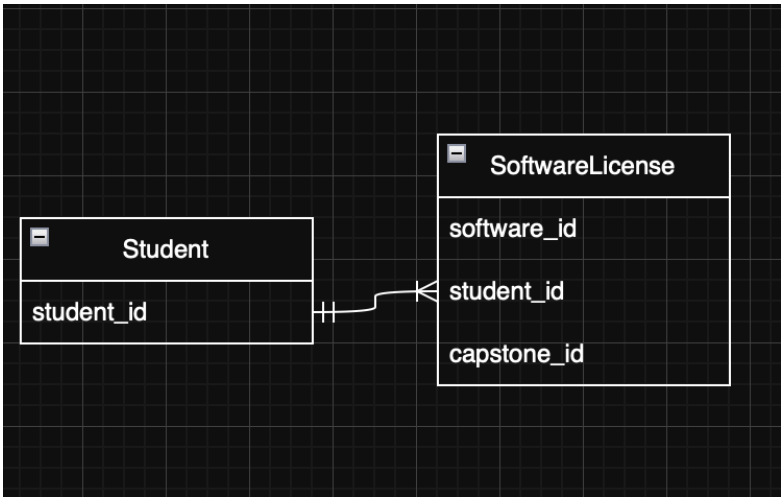
2. CICerts is a new database that tracks students and their professional certifications. A single student may earn multiple certifications, but a student does not need to have any certifications. Each certification must be tied to a recognized certifying organization. Construct the ERD for this database. (2pts)



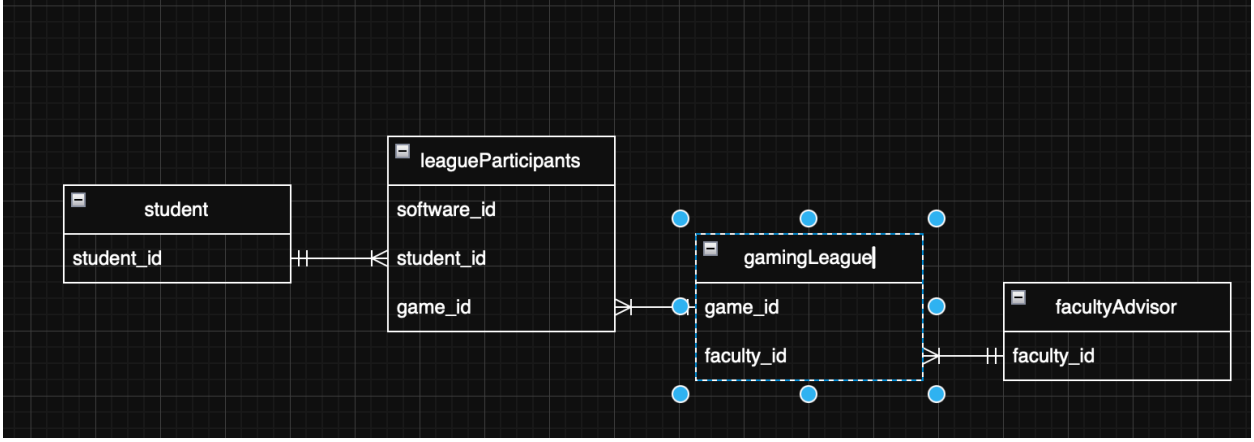
3. CIResearchMatch is a new matching database at CI that connects CSIT students with faculty-led research projects. Many students may participate in many research projects over time, but a student may only participate in one research project per semester. Reconstruct the ERD for this database. (2pts)



4. CISoftwareLicenses is a new database to track software licenses issued to students for capstone projects. A student may be assigned multiple software licenses. Construct the ERD for this database. (2pts)



5. CIGamingLeagues is a new database to track competitive gaming leagues at CI. Each gaming league requires exactly one faculty adviser. Students may participate in multiple gaming leagues, and each league may include many student players. Construct the ERD for this database. (2pts)



Part IV. Go! (10pts)

Figure 5 represents the the conceptual model for CI Clinic (CIC), which tracks patients, doctors, clinics and appointments.

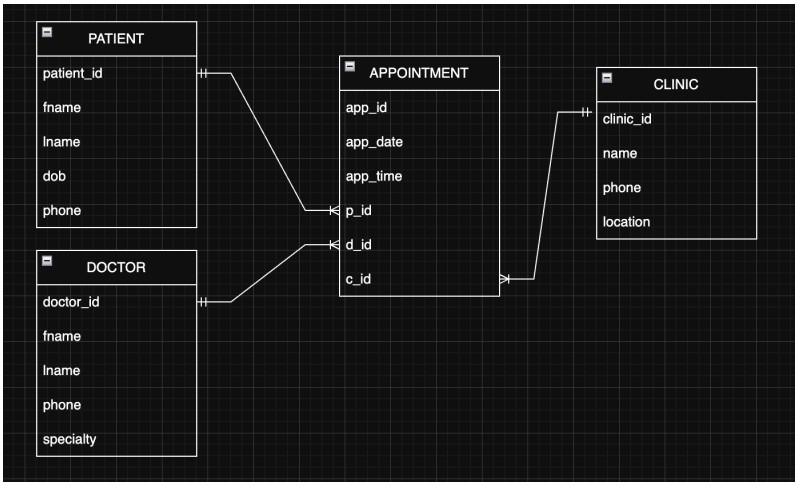


Figure 5 - CI Clinic DB ERD

1. Identify primary and foreign keys along with their datatypes and field sizes for each attribute. Patient is started off for you.

PATIENT patient_id: *int(8) (PK)* fname: varchar(32) lname: varchar(32) dob: varchar(10) phone: varchar(10)	**DOCTOR** doctor_id: int(8)(PK) fname: varchar(32) lname: varchar(32) specialty: varchar(16) phone: varchar(10)
CLINIC clinic_id: int(8) (PK) name: varchar(32) phone: varchar(32) location: varchar(32)	**APPOINTMENT** app_id: int(8)(PK) app_date: varchar(10) app_time: varchar(7) c_id: int(8) (FK) d_id: int(8) (FK) p_id: int (8) (FK)