

Weijie Mao

CMSC 461

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Project 1 Final Report

1. Project Description

This application is developed to manage the vaccination of folks in the country of Wonderland.

The users of the application are the folks residing in Wonderland and staff of the health department. It is assumed that all users have network computers capable of running Web browsers.

2. User Requirements

Folks

The information stored on each individual in Wonderland includes a 16-digit personal identification number, name (first and last), date of birth, 10-digit telephone numbers (work, mobile, and home), and one or more email addresses. Identification numbers are unique across Wonderland. All folks of Wonderland reside at a place, and some folks may share a place.

Health Staff

Some folks are staff members of the Health Department. Staff can be doctors, nurses, assistants, or administrators. Health staff are scheduled to work at a health center for some time period (given by start and end dates). Some staff may not be scheduled at all.

Places

Each place in Wonderland has an address (street number and name, city, state, zipcode) and XY-coordinates (see below). The coordinates and addresses of places in Wonderland are both unique (i.e. no vertical stacking of places). Places can be either residences or Health Centers.

Health centers have unique acronyms (with at most 4 alphanumeric characters [A-Z0-9]) and operating hours. Operating hours is a list of weekday-time period pairs (i.e. weekday name, and start and end time in HH:MM).

The geographic extent of Wonderland is a flat plane. Wonderland uses a standard XY Cartesian 2D orthogonal system of axes with the origin at its capital city, Megapolis, and units of miles. Distances between places are computed using the standard Pythagorean Theorem.

Vaccination Registry

Wonderland folks register with the Health Department to receive a dose of a vaccine by entering their personal identifier, and desired date and health center that they wish to get vaccinated at, and the short-name of their desired vaccine. In order to choose their desired health center, folks ask to first see the number of folks already registered at each health center in their city on their desired date, and then they quickly complete their registration. An individual may register or modify their registration up to the day prior of the registration's date.

Vaccines

The Health Department maintains a list of vaccines it offers. Each vaccine has a unique short name (with at most 4 alphanumeric characters [A-Z0-9]), a long name, and the time period it is offered. All offered vaccines are available at all health centers. Folks can only register for vaccines offered at their registration time (including when updating an existing registration).

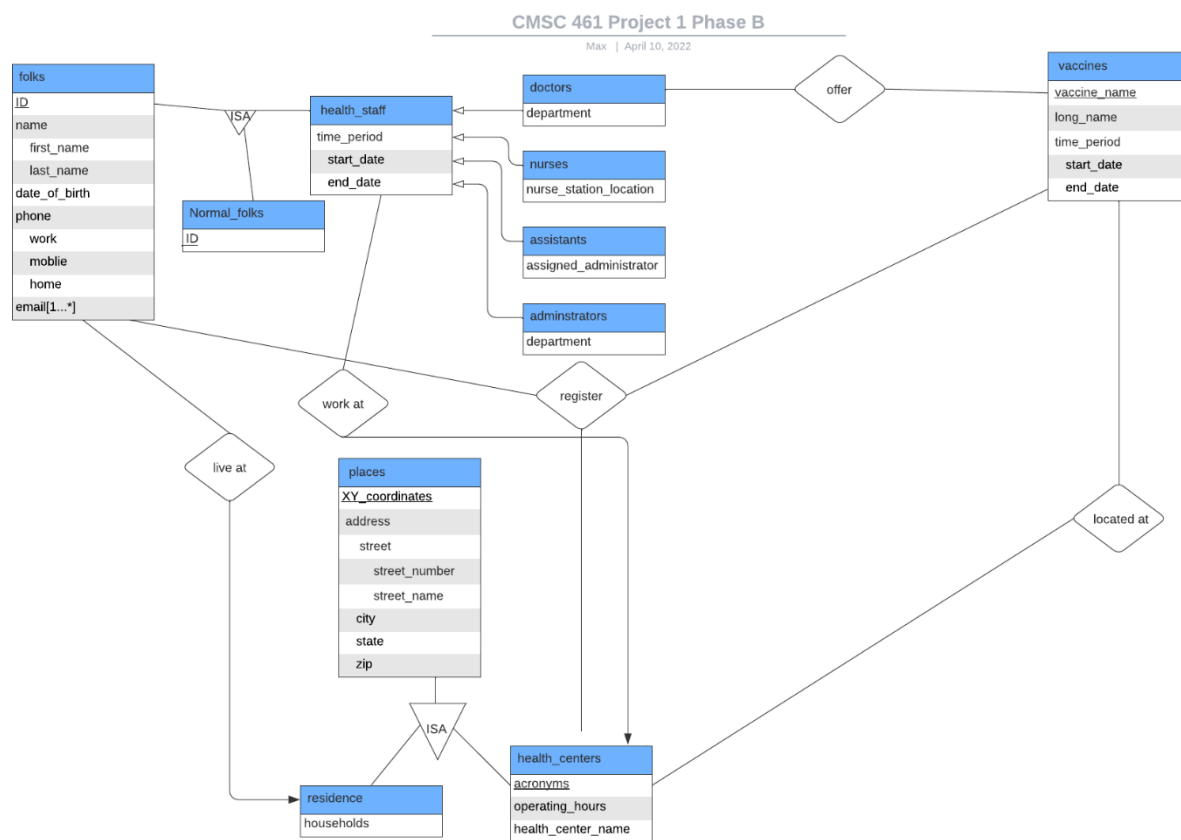
The vaccine list is dynamic (eg. new vaccines may be added or existing vaccines may have their availability dates or names modified). Modifying availability dates of existing vaccines should be mindful of prior registrations.

Time periods are specified by a start and end date (each one of which may be NULL).

3. Accomplishments

The author successfully created a database of vaccination according to the requirements. The database could perform normal operations such as insertion and deletion.

4. Updated E-R Diagram



Phase C

5. Relational Data Model

Reduction for Entities:

folks (ID, name (first_name, last_name), date_of_birth, phone (work, mobile, home), email)

doctors (department)

nurses (nurse_station_location)

assistants (assigned administrator)

administrators (department)

places (XY coordinates, address (street (street_number, street_name), city, state, zip))

vaccines (vaccine_name, long_name, time_period (start_date, end_date))

ISA relationship:

folks (ID, name (first_name, last_name), date_of_birth, phone (work, mobile, home), email)

health_staff (time_period (start_date, end_date))

Primary Key: ID

Foreign Key: health_staff(ID)->folks(ID)

normal_folks(ID)

Primary Key: ID

Foreign Key: normal_folks(ID)->folks(ID)

places (XY_coordinates, address (street (street_number, street_name), city, state, zip))

residence (households)

Primary Key: XY_coordinates

Foreign Key: residence (XY_coordinates) ->places(XY_coordinates)

health_centers (acronyms, operating_hours, health_center_name)

Primary Key: XY_coordinates

Foreign Key: health_centers (XY_coordinates) ->places(XY_coordinates)

Relationships:

live_at (ID, XY_coordinates)

Primary Key: ID, XY_coordinates

Foreign Key:

live at (ID)->folks(ID)

live at (XY_coordinates) -> residence (XY_coordinates)

work_at (ID, XY_coordinates)

Primary Key: ID, XY_coordinates

Foreign Key:

work at (ID)->health_staff (ID)

work at (XY_coordinates) -> health_centers (XY_coordinates)

offer (ID, vaccine_name)

Primary Key: ID, vaccine_name

Foreign Key:

offer (ID)->doctor (ID)

offer (vaccine_name) -> vaccine (vaccine_name)

located_at (vaccine_name, XY_coordinates)

Primary Key: vaccine_name, XY_coordinates

Foreign Key:

located at (vaccine_name)-> vaccine (vaccine_name)

located at (XY_coordinates) -> health_centers (XY_coordinates)

register (ID, vaccine_name, XY_coordinates)

Primary Key: ID, vaccine_name, XY_coordinates

Foreign Key:

register (ID) -> folks(ID)

register (ID)-> vaccine (vaccine_name)

register (XY_coordinates) -> health_centers (XY_coordinates)