

David Havrilla

CSPB3287

Project Ideation

Concept

My database is a relational database of the blood donation system (1). The database will include tables of data about the patient/recipient, donor, as well as data about the blood bank where the product is stored. Regarding my topic of choice, I picked from the free datasets since it provides a good starter outline. I think it will be easier to focus on the actual database management this way. I also like the blood donation system topic based on logistical importance. According to the Red Cross (2), some of the blood products, such as platelets, have a shelf life of only 5 days. The importance of both accuracy and availability of the data is critical in this kind of database.

Below is an example of the tables:

Data_of_Patient(patient_name, patient_id, patient_blood_group, patient_disease)

Data_of_Donor(donor_name, donor_id, donor_blood_group, donor_medical_report, donor_address, donor_contact_number)

Data_of_BloodBank(bloodbank_name, bloodbank_address, bloodbank_donor_name, bloodbank_contact_number)

Platform and Tools

I plan to use MySQL Workbench to construct the database. The database will be forwarded and hosted in Google Cloud SQL. Any queries constructed or data inserted and deleted will be performed using SQL Alchemy via Jupyter Notebook.

Hope to Learn

From the database project itself, my goal is to better understand database management systems through practice and experience. I think the creation of a database from scratch with either randomized data or collected data will aid in that capacity. Additionally, I hope to improve on my skills to work with a relational database in terms of hosting with a cloud service.

Demonstration

I plan to demonstrate my database and what I have learned through a private video presentation that can be uploaded to a website, such as YouTube, and accessed via provided link.

References:

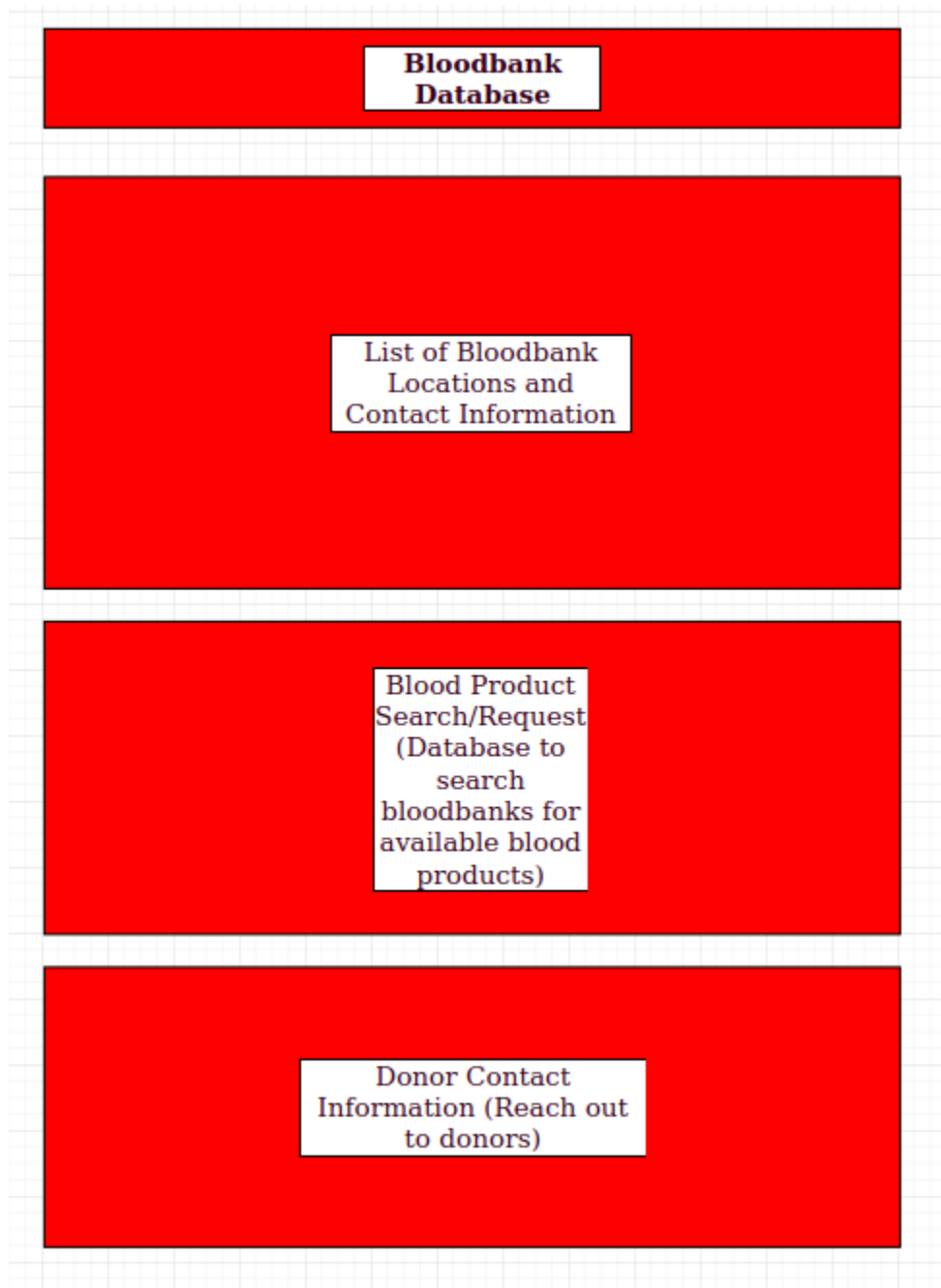
(1) <https://www.lovelycoding.org/2013/11/top-18-database-projects-ideas-for-engineering-bca-mca-btech-bsc.html>

(2) <https://www.redcrossblood.org/donate-blood/how-to-donate/types-of-blood-donations/blood-components.html>

Project Proposal

My goal is to build a web application. A rough sketch using the drawing app in JupyterLab provides a rough draft for what I envision as the concept. Given that it's a bloodbank database, I want it to be available as a public database for healthcare facilities and providers. It should be easily accessible and easy to navigate. Nothing too complicated or fancy.

I also plan to use the Google cloud database for storing and accessing data. The SQL interface I plan to use is SQLAlchemy. Much of my work will be completed utilizing JupyterLab.



Project Write-up

The goal of my project was to create a web-app database for a blood bank. I hoped to use Flask as a framework tool for my web-app development and launch it using Heroku. Since I have used both previously, I felt most comfortable implementing my web-app using these tools. The idea of the web-app would be used by blood banks to be able to track both donor and patient information. The blood bank would be able to reach out to prior donors having access to their contact information. The web-app would additionally provide the blood bank with knowledge of where blood was received from and who it was going to, allowing for either further analysis for level of use or tracking blood products for any potential safety issues.

A large portion of what intrigued me about this type of database is the importance of both importance up-time and the resources involved in maintaining it, and confidentiality, as noted in a review regarding HIPAA (health insurance portability and accountability act) compliance. To avoid any concerns with HIPAA, I was going to use randomly generated SQL database data using a Python package such as Faker. Rather than focusing on loading mock data from a package or creating my own python script for randomly generated data, I used a small subset of fictional characters. Given the intent of using a real population, I chose to limit the information contained within the blood bank. The blood bank table only contains name information from the donor directly, rather than the patient. Information can still be obtained about the patient through the blood bank table based on the relationship but is not directly available. Within the patient table, the patient can be identified using an id number as having utilized a particular blood bank id. The blood bank would then be able to identify a patient by id as needed for further contact information.

The ER diagram outlines the relationship between tables as being many-to-many, since patients can get blood from multiple blood banks and multiple patients can use the same blood bank. The same additionally applies to the donor table with a many-to-many relationship with the blood bank table. As it is my original ER diagram, I did decide to remove direct donor information from the blood bank table, as it is more efficient to include only information about the actual blood bank rather than insert an entry for every donor.

VIDEO LINK: <https://youtu.be/UalAxHcnp6w>

