Data Model

Normalisation

Since all entities and relations in our ER diagram had only primary key related functional dependencies, our schema is already in 3NF/BCNF and we do not need to do normalisation

Initial dataset

We are generating data to form our initial dataset. A lot of the values are being generated randomly to account for all possible scenarios. The parameters for data generation are basically the number of entries for each table that need to be created though we these values should not be very different in magnitude else the script might try to create too many values out of a very few values. The parameters are:

1. No_ppl: number of people in the dataset, default value set to 100
2. No_docs: number of people that should be made doctors. Kept >10 to allow atleast one doctor of each speciality. Default value set to 12
3. No_support: number of people that are support staff. The set of doctors and support staffs are kept distinct. Default set to 10
4. No_admin: number of people that are admin. Default set to 2
5. No_patients: number of patients cases in the hospital. Default set to 500
6. No_rooms: number of rooms, default set to 20
7. No_weeks: number of weeks for which we are capturing the patient-doctor interaction data. Default set to 4
8. No_slots: number of slots in each week that each doctor is available in
9. Ratio of number of patient cases created for doctor appointments and number created for admission into the hospital. Default is that 80% patient cases created for appointments and 20% admitted to the hospital
10. No_tests_taken: number of tests that were conducted on patients. Default set to 100
11. No_outside_purchases: number of medicine purchases that were made from the pharmacy of the hospital in consideration

Values picked
First names, last names, areas and pincodes: most common values picked from the internet. Randomly shuffled while create entries in people table

First names=["James", "John", "Robert", "Michael", "William", "David", "Richard", "Joseph", "Thomas", "Charles", "Mary", "Patricia", "Jenniffer", "Linda", "Elizabeth", "Barbara", "Susan", "Jessica", "Sarah", "Nancy"]

Last names=["Smith", "Johnson", "Williams", "Brown", "Jones", "Garcia", "Miller", "Davis", "Rodriguez", "Martinez", "Hernandez", "Lopez", "Gonzalez", "Wilson", "Anderson", "Thomas", "Taylor", "Moore", "Jackson", "Martin"]

Areas=["New Delhi", "Mumbai", "Chennai", "Coimbatore", "Noida", "Kukatpally", "Gurgaon", "Tirpur", "Bellandur","Thane"]

Pin codes=[110001,400001,600001,641001,201301,500072,122001,641601,560103,400601]

Qualification: currently only added a few doctor qualifications and a few other qualifications like

 ["MBBS","MD","BS","MS","Diploma","Metric"]
Diseases: picked from a collection of 20 most common diagnosed diseases lists from the internet. The final list is

 ["Hypertension", "Diabetes", "Back pain", "Anxiety", "Obesity", "Allergy", "Esophagitis", "Asthma", "Visual refractive errors", "Osteoarthritis", "Joint pain", "Sinusitis", "Depression", "Bronchitis", "Fungal infection"]

Symptoms: listed a few symptoms of the aforementioned diseases. Tried to include as many cases of overlaps between symptoms of various diseases as possible. The overall list is

["Headache","Fatigue","Chest Pain","Breathing difficulty","Very thirsty","Very hungry","Unexplained weight loss","Blurry vision","Back pain","Nervousness","Increased heart rate","Panic","Tiredness","High BMI","Sneezing","Blocked nose","Itch","Difficulty swallowing","Heartburn","Wheezing","Joint pain","Joint stiffness","Cough","Sad","Skin redness"]

Doctor speciality: took the union of specialist doctors for all of the diseases selected above
Support role: picked 5 possible roles that a support staff could perform. The list of specialities chosen are:

["Endocrinologist", "Chiropractor", "Psychiatrist", "Bariatric" ,"General Physician", "Pulmonologist", "Ophthalmologist", "Orthopaedic", "ENT", "Dermatologist"]

Room and bed types: A room is either for examination, operation or is a ward. There are two types of wards and two types of beds in each ward

Diagnostic tests: ["Blood test","MRI","CT","X-Ray","RTPCR"]

Medicines: ["Aspirin","Vitamin C", "Riboflavin", "Tetracycline","Captoporil","Chloroquine","Dexamaethasone","Diosmin","Salbutamol","Erythromycin"]
Arbitrary names given to medicine manufacturers

Frequency of taking medicines:
["OD","TD","W","Need"]
These are supposed to mean once a day, twice a day, weekly and as per need. Other frequencies could of course be possible

Payment choices: ["Cash","Cheque","Card","Online"]

Controller

We will be building an externalised controller using flask that will route all GET/POST requests through a routes.py file. The functions called through routes.py will perform database querying and other operations and decide what next to show to the user and what page to render.