

5 Hospital Emergency

In a bustling city, emergencies strike at unexpected moments. When a medical crisis occurs, the city's emergency alert system ensures that patients receive the care they need as quickly as possible. The system relies on ambulances, hospitals, and doctors working together to save lives. Patients are individuals in need of medical attention. Each patient has a name, a severity level ranging from 1 (mild) to 10 (critical), and a status indicating whether they have fully recovered. When a doctor treats a patient, their severity level is reduced based on the doctor's efficiency. If the severity reaches zero, the patient is marked as treated. This process not only reduces the severity level but also checks if the patient has recovered. Ambulances transport the patients. Ambulances can be distinguished between each other; each has a status indicating if it can transport a patient, and a destination hospital where it will take the patients. Hospitals are the core of the system, where treatment takes place. The Hospital represents a medical center with a name, a capacity defining the number of patients it can accommodate, and a list of both patients and doctors. The hospital registers a patient if there is space and can also register a doctor to the hospital's staff. When it is time for treatment, the hospital instructs all doctors to care for all untreated patients. Doctors are responsible for treating patients. A doctor has a name and an efficiency level, which determines how much the doctor can reduce a patient's severity per session. Overseeing all these operations is the emergency alert system. It manages all of the hospitals and ambulances, ensuring that patients are taken to available hospitals. The system allows new hospitals and ambulances to join the system, and retrieves a hospital not at full capacity, if any. When a patient needs transport, the system finds an available hospital and the first ambulance available to transport them. If no hospitals have space or no ambulances are free, the patient must wait. Once patients arrive at hospitals, the system ensures that doctors begin their work. The main simulation ties everything together. It initializes the alert system, registers hospitals and doctors, assigns ambulances, and simulates patient arrivals. Simulate, start the treatments, and show the actions!

- the class diagram :

- use case diagram :

(If it can't be seen from here, I uploaded jpeg file in zip file).

