Problem Statement: Develop a web application to facilitate digitalizing the hospitality process for group accommodation. The application should allow users to upload two CSV files to efficiently allocate rooms in hostels while ensuring group members with the same ID stay together and adhere to hostel capacities and gender-specific accommodations.

PROBLEM APPROACH

Creating a web application for digitalizing the hospitality process for group accommodation involves several steps, including designing the frontend, backend, and integrating the logic for processing CSV files.

PROJECT OUTLINE

1. **Requirements Gathering and Planning**
2. **Frontend Development**
3. **Backend Development**
4. **CSV Processing Logic**
5. **Room Allocation Algorithm**
6. **Deployment and Testing**

Requirements Gathering and Planning

- **Users**: Admins who manage the accommodation.
- **Features**:
    - Upload two CSV files: One for group details and one for hostel details.
    - Process CSV files to allocate rooms ensuring group members with the same ID stay together.
    - Adhere to hostel capacities and gender-specific accommodations.
    - Display allocation results.

Frontend Development

REACT framework has been used for seamless experience.

Backend Development

Node.js frameworks have been used.

CSV Processing Logic

- Parse the CSV files.
- Organize group members by ID.
- Ensure gender-specific allocations.
- Respect hostel capacities.

Room Allocation Algorithm

- Iterate through groups and allocate them to available rooms.
- Ensure groups with the same ID stay together.
- Check room capacities and gender restrictions.

Pseudocode for Room Allocation Algorithm

1. **Read Input Data**
    - Parse the CSV files to get group and hostel data.
2. **Organize Data**
    - Group members by `groupId`.
    - Group hostels by `gender`.
3. **Allocate Rooms**
    - Iterate over each group.
    - Try to find a suitable room based on gender and remaining capacity.
    - Allocate the room if suitable, otherwise mark the group as unallocated.

Respective Codes have been given.