Digitalization of the Hospitality Process: Web Application Documentation

1. Project Overview

1.1. Introduction

The **Digitalization of the Hospitality Process** web application is designed to streamline the process of room allocation for group accommodations in hostels. The application facilitates the management of group bookings by allowing users to upload CSV files containing group and hostel information, and then processes these files to allocate rooms efficiently based on group size, gender, and room capacities.

1.2. Objectives

- **Efficient Room Allocation**: Automate the process of allocating rooms to groups based on their size, gender, and available hostel capacities.
- **User-Friendly Interface**: Provide an intuitive web interface for users to upload CSV files and view results.
- **CSV Output**: Generate a downloadable CSV file with the allocation details for record-keeping and further use.

1.3. Key Features

- **CSV File Upload**: Users can upload two CSV files: one for group information and one for hostel information.
- **Room Allocation Algorithm**: The application uses a defined algorithm to allocate rooms to groups while considering gender and room capacities.
- **Results Display**: Allocated rooms are displayed in a tabular format on the results page.
- **Download CSV**: Users can download a CSV file containing the allocation details.

2. Technical Details

2.1. Technologies Used

- **Python**: Programming language used for backend development.
- **Flask**: Web framework for building the web application.
- **Pandas**: Library for data manipulation and analysis.
- **HTML/CSS**: Technologies for creating and styling the web pages.

2.2. File Structure

```
hospitality_app/
│
├── app.py
├── templates/
│   ├── index.html
│   └── result.html
└── static/
    └── css/
        └── styles.css
```

2.3. CSV File Formats

- **Group Information CSV (`group_info.csv`)**

Group ID	Members	Gender
101	3	Boys
102	4	Girls
103	2	Boys
104	5	Girls
105	8	5 Boys & 3 Girls

- **Hostel Information CSV (`hostel_info.csv`)**

Hostel Name	Room Number	Capacity	Gender
Boys Hostel A	101	3	Boys
Boys Hostel A	102	4	Boys
Girls Hostel B	201	2	Girls
Girls Hostel B	202	5	Girls

2.4. Algorithm Overview

The room allocation algorithm processes the group and hostel data to allocate rooms based on the following criteria:

- **Group members with the same ID should stay together.**
- **Groups are allocated rooms in hostels that match their gender.**
- **Room capacities are not exceeded.**
- **Groups are assigned to the first available room that fits their size.**

3. Installation Instructions

3.1. Prerequisites

- **Python 3.7 or later: Download Python**
- **Pip: Package installer for Python (usually comes with Python installations).**

3.2. Setting Up the Project

Clone or Download the Project Files

```
git clone https://github.com/vignesh-naik-720/hospitality_app

cd hospitality_app
```

Install Required Dependencies

```
pip install Flask pandas
```

3.3. Running the Application

Navigate to the Project Directory

```
cd path/to/hospitality_app
```

Run the Flask Application

```
python app.py
```

4. User Guide

4.1. Accessing the Application

Open your web browser and go to http://127.0.0.1:5000/ to access the homepage.

4.2. Uploading CSV Files

1. **On the Homepage, you will see two file upload fields:**
    - **Upload Group Information CSV: Click "Choose File" and select the `group_info.csv` file.**
    - **Upload Hostel Information CSV: Click "Choose File" and select the `hostel_info.csv` file.**
2. **Click "Process CSVs" to upload the files and process the data.**

4.3. Viewing Results

After processing, you will be redirected to the results page where you can:

- **View the Allocation Results: A table displaying group IDs, hostel names, room numbers, and members allocated.**
- **Download the CSV File: Click the "Download CSV" link to get a file containing the allocation details.**
- **Upload New Files: Click the "Upload New Files" link to return to the homepage and process new files.**

5. Troubleshooting

5.1. Common Issues and Solutions

- **Issue: Flask Server Doesn't Start**
    - **Solution: Ensure that the virtual environment is activated and the `Flask` and `pandas` libraries are installed. Check for syntax errors in `app.py`.**
- **Issue: CSV Files Not Uploading**
    - **Solution: Make sure the CSV files are correctly formatted and contain the required columns. Ensure that both files are uploaded before clicking "Process CSVs".**
- **Issue: Results Table Is Empty**
    - **Solution: Check the console logs for errors. Verify that the `group_info.csv` and `hostel_info.csv` files have correct data and that the groups fit into the available rooms.**

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