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Roommate Matcher: An Approach to Assigning Roommates in Schools Based on Compatibility

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Abstract: In many educational institutions, the process of assigning roommates is often conducted randomly, leading to potential conflicts and dissatisfaction among students. This document introduces "Roommate Matcher," a system designed to improve the roommate assignment process in Ghanaian schools by matching students based on compatibility. Roommate Matcher aims to address the issues arising from random room assignments, such as conflicts, stress, and poor academic performance, by utilizing a structured approach to pair students with similar habits and preferences. This study explores the purpose, scope, research questions, technologies used, and realistic applications of Roommate Matcher, specifically tailored to the context of Ghanaian schools.

Keywords: Roommate compatibility, Student preferences, Room assignment system.

I. Introduction

The assignment of roommates in educational institutions has traditionally been a random process, most often you find about two students in a room who only have the programme they read in common, which often results in conflicts and discomfort among students due to lifestyle differences. These conflicts can lead to stress, poor academic performance, and frequent complaints, creating an urgent need for a smarter room assignment technique. Roommate Matcher provides a solution by matching compatible students based on their preferences, backgrounds and habits, thereby fostering a more harmonious and conducive living environment.

Background

In Ghanaian schools, hostel accommodations play a crucial role in the overall student experience if students do not live anywhere close to their schools. The current random assignment process often leads to mismatches in roommate compatibility, resulting in various issues that affect students' well-being and academic performance and overall living experience. The need for a systematic approach to roommate assignment though has not become increasingly evident, prompts the development of the Roommate Matcher.

Objectives

The primary objectives of Roommate Matcher are to:

- Collect important details from students,
- Use the details gathered to match students with compatible habits and preferences.
- Aid school management to make improved roommate decisions.
- Abate conflicts in hostels/hall.

Purpose of the Study

The primary purpose of this study is to develop and implement a system that enhances the roommate assignment process in Ghanaian schools. By focusing on compatibility, Roommate Matcher aims to:

- Reduce roommate conflicts and enhance the overall living experience for students.
- Minimize stress and discomfort, thereby improving academic performance and student satisfaction.
- Provide hostel managers with a data-driven tool to make informed decisions about room assignments.

Scope of the Study

The scope of this study encompasses the development and implementation of the Roommate Matcher system in Ghanaian schools. The system is designed to:

- Collect key student preferences through a structured questionnaire.
- Utilize advanced algorithms to match students based on compatibility.
- Provide a user-friendly interface for both students and hostel managers.

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- Offer a feedback mechanism in the future to continuously improve the matching process.

Research Questions

The research questions guiding this study are designed to address the multifaceted nature of roommate compatibility and its impact on student life. These questions include:

- What are the key preferences and habits that influence roommate compatibility among students in Ghanaian schools?
- How can these preferences and habits be effectively collected and analyzed to match compatible roommates?
- What are the potential benefits and challenges of implementing a compatibility-based roommate assignment system in Ghanaian schools?
- How can the Roommate Matcher system be continuously improved based on user feedback and changing student preferences?

II. Literature Review

Importance of Compatibility in Roommate Assignments

Research has shown that compatibility in roommate assignments significantly impacts students' living experiences and academic performance. Studies have demonstrated that students paired with compatible roommates tend to have lower stress levels, higher satisfaction with their living arrangements, and improved academic outcomes.

Data-Driven Decision Making in Educational Settings

The use of data-driven decision-making tools in educational settings has gained traction in recent years. These tools provide valuable insights and enable institutions to make informed decisions that enhance student experiences and outcomes. The integration of technology in educational management has been shown to improve operational efficiency and student satisfaction.

Role of Technology in Improving Student Life

Technology plays a crucial role in modern educational settings, offering innovative solutions to traditional challenges. The application of web technologies and data management systems in educational contexts has been shown to enhance student life and academic performance.

III. Methodology

Data Collection

The Roommate Matcher system begins with a comprehensive data collection process. Students are required to fill out a preference form that includes questions about their cleanliness level, preference for a quiet or social environment, sleep schedules, smoking and drinking habits, health issues, etc. This data is crucial for understanding the lifestyle and preferences of each student, forming the basis for compatibility matching.

Data Analysis and Matching

Once the preference data is collected, the system employs advanced algorithms to analyze and match students based on their compatibility. The matching process involves:

- Comparing the answers provided by students to identify similarities and potential matches.
- Utilizing a scoring system to quantify compatibility and rank potential roommate pairs.

System Review and Adjustment

After the initial room assignments are made, hostel / hall managers have the opportunity to review and adjust the assignments as needed. This flexibility ensures that any issues or conflicts that arise can be promptly addressed, further enhancing the effectiveness of the Roommate Matcher system.

Technologies to be Used

The development of the Roommate Matcher system leverages a variety of modern web technologies and robust backend systems. The tools and technologies used in this project are detailed as follows:

Frontend Technologies

The frontend of the Roommate Matcher application would be developed using a combination of HTML and CSS These technologies are fundamental for creating a responsive and intuitive user interface. HTML provides the structure of the web pages, CSS is used for styling and layout, ensuring a seamless user experience.

Backend Technologies

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The backend logic of the application would be implemented using Python or PHP. These programming languages are chosen for their robustness and flexibility in handling server-side operations. Python, known for its simplicity and powerful libraries, or PHP, with its wide adoption in web development, ensure the smooth and efficient functioning of the application, handling data processing, and business logic.

Database Management

MySQL would be used as the database management system for the Roommate Matcher. MySQL is a reliable and scalable solution for storing and managing user data. It ensures data integrity and security, providing a solid foundation for the application's data storage needs. The choice of MySQL is driven by its performance, ease of use, and compatibility with various web technologies.

Limitations

While the Roommate Matcher system offers significant advantages, it is essential to acknowledge its limitations:

- **Data Accuracy:** The effectiveness of the system relies heavily on the accuracy and honesty of the data provided by students. False or misleading information can lead to incompatible matches.
- **Cultural and Personal Differences:** The system may not fully account for the cultural and personal differences that can influence roommate compatibility, potentially leading to conflicts.
- **Resource Intensive:** Implementing and maintaining the system requires significant resources, including time, expertise, and financial investment.

Delimitations

The Roommate Matcher system is specifically designed for use in Ghanaian schools and may not be directly applicable to other contexts without modifications. The study focuses on the following delimitations:

- The system is tailored to the unique cultural and social dynamics of Ghanaian schools.
- The matching algorithm is based on a specific set of preferences and habits, which may not cover all aspects of roommate compatibility.
- The study is conducted within a limited timeframe and may not capture the long-term effects and adaptations of the system.

Applications in Schools

The Roommate Matcher system has several applications in Ghanaian schools, including:

- Enhanced Student Life: By matching compatible roommates, the system can significantly enhance the living experience for students, reducing conflicts and stress.
- Improved Academic Performance: A harmonious living environment can lead to improved academic performance, as students are better able to focus on their studies.
- Informed Decision Making: The system provides hostel managers with valuable data and insights, enabling them to make informed decisions about room assignments.
- Continuous Improvement: The feedback mechanism allows for continuous improvement of the system, ensuring that it remains effective and relevant over time.

Potential Benefits

The implementation of the Roommate Matcher system in schools offers several potential benefits which include:

- **Reduced Conflicts**: By matching students based on compatibility, the system can significantly reduce the number of conflicts arising from lifestyle differences.
- **Improved Well-being:** A harmonious living environment can enhance students' overall well-being, leading to improved mental health and academic performance.
- **Increased Satisfaction:** Students are likely to be more satisfied with their living arrangements, leading to a more positive and productive educational experience.

Challenges and Considerations

While the Roommate Matcher system offers significant advantages, there are also challenges and considerations to be addressed. These challenges include:

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- **Data Privacy:** Ensuring the privacy and security of student data is paramount. The system must comply with data protection regulations and implement robust security measures.
- **Cultural Sensitivity:** The system must be designed to be culturally sensitive and inclusive, accounting for the diverse backgrounds and preferences of students.
- **Resource Allocation:** Implementing and maintaining the system requires significant resources, including time, expertise, and financial investment. Schools must carefully consider the allocation of these resources.

IV. Conclusion

The Roommate Matcher system represents a significant advancement in the roommate assignment process for Ghanaian schools. By focusing on compatibility and utilizing advanced technologies, the system offers a data-driven solution to enhance student life and improve academic performance. While there are limitations and challenges to its implementation, the potential benefits make it a valuable tool for educational institutions. Future research and development can further refine and expand the system, ensuring its effectiveness and applicability in diverse contexts.

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