Report on gtuStudentGrades Program

Introduction:

The gtuStudentGrades program serves as a comprehensive solution for managing student grades within a file-based system. This program is meticulously crafted using the C programming language, leveraging a variety of functionalities such as file I/O operations, process management (via fork and waitpid), and intricate string manipulations. Its primary goal is to streamline the process of recording, accessing, and manipulating student grades efficiently and effectively.

Functionality Overview:

1. **addStudentGrade:** This functionality allows users to seamlessly append a new student's grade to the existing file. Before adding the grade, it meticulously checks whether the student already exists to avoid redundancy.

2. **searchStudent:** Users can effortlessly locate a specific student within the file by providing the student's name. Upon successful retrieval, the program promptly displays the student's grade, facilitating quick access to pertinent information.

3. **sortAll:** Sorting all student grades becomes a breeze with this feature. Users are presented with the option to sort the grades either by the student's name or their grade. This flexibility caters to diverse user preferences and requirements.

4. **showAll:** For users seeking an overview of all student grades stored in the file, the showAll functionality proves invaluable. It efficiently displays all grades, ensuring users have comprehensive visibility into the dataset.

5. **listGrades:** In scenarios where users prioritize brevity and wish to preview a concise subset of grades, listGrades comes to the rescue. It succinctly lists the first five student grades from the file, offering a quick snapshot of the dataset.

6. **listSome:** Users can tailor their grade listings according to specific criteria using listSome. By specifying the desired number of entries per page and the page number, users can navigate through the dataset with ease, enhancing usability and accessibility.

Code Structure:

- The program's architecture revolves around modularity, with distinct functions dedicated to each task. This design approach enhances code readability, maintainability, and scalability.

- Command-line argument parsing is facilitated by the split_command function, which intelligently dissects user input into tokens for seamless processing. This robust parsing mechanism contributes to the program's versatility and user-friendliness.

- Extensive error handling mechanisms are integrated throughout the codebase to mitigate potential issues during file operations, process creation, and command-line argument validation. By preemptively addressing potential pitfalls, the program ensures robustness and reliability.

Logging:

- The program meticulously logs each task completion event along with a timestamp, providing users with a comprehensive audit trail of activities performed. This logging functionality enhances transparency, accountability, and troubleshooting capabilities.

- Logging is facilitated through the logTaskCompletion function, which appends informative messages to the designated log file. By systematically documenting task completions, the program fosters a structured approach to data management and analysis.

Usage Instructions:

- Clear and concise usage instructions are provided for each command, ensuring users can leverage the program's functionalities with ease and confidence. These instructions serve as a valuable reference point, empowering users to maximize their productivity and efficiency.

- The program seamlessly accommodates interactive command input, enabling users to intuitively interact with the system and execute desired actions effortlessly. This interactive mode fosters a seamless user experience and promotes user engagement.

Conclusion:

The gtuStudentGrades program represents a pinnacle of excellence in student grade management, offering a rich array of functionalities meticulously designed to streamline data manipulation tasks. With its robust architecture, comprehensive error handling mechanisms, and intuitive user interface, the program sets a new standard in efficiency, reliability, and usability. As educational institutions grapple with increasingly complex data management challenges, gtuStudentGrades emerges as a beacon of innovation, empowering educators and administrators alike to harness the power of technology for enhanced academic outcomes.

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Lisa Harris, BB
Lisa Jones, DC
Margaret Anderson, AA
Margaret Clark, VF
Margaret Harris, NA
Margaret Miller, AA
Mark Lopez, VF
Mark Martin, CC
Mark Sanchez, AA
Mary Jackson, BB
Mary Martinez, DD
Mary Perez, FF
Mary Thomas, DD
Matthew Brown, DD
Matthew Lee, FF
Matthew Moore, CB
Matthew Williams, BB
Mehmet Kaya, AA
Michael Clark, FF
Michael Davis, BA
Michael Jackson, BB
Michael Perez, CC
Nancy Harris, VF
Nancy Lewis, CC
Nancy Sanchez, VF
Patricia Clark, AA
Patricia Martin, FF
Patricia Robinson, AA
Richard Clark, NA
Richard Lewis, BB
Richard Lopez, BA
Richard Thompson, AA
Robert Davis, BA
Robert Lewis, CC
Sandra Brown, FF
Sandra Perez, BB
Sarah Jackson, DC
Sarah Ramirez, BB
Sarah Rodriguez, DD
Sarah Taylor, DC
Sarah Thompson, AA
William Jones, BA
William Perez, FF
William Wilson, DD
Enter command:
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Enter command:
Usage:
gtuStudentGrades "grades.txt"
addStudentGrade "grades.txt" "Name Surname" "AA"
searchStudent "grades.txt" "Name Surname"
sortAll "grades.txt" "name or grade"
showAll "grades.txt"
listGrades "grades.txt"
listSome "grades.txt" "numOfEntries" "pageNumber"
Enter command: sortAll "grades.txt" "name"
Anthony Clark, CB
Anthony Gonzalez, NA
Anthony Lewis, VF
Anthony Smith, BA
Anthony Wilson, NA
Barbara Brown, FF
Barbara Garcia, BA
Barbara Hernandez, VF
Barbara Lopez, DD
Barbara Martin, VF
Barbara Williams, NA
Betty Anderson, NA
Betty Davis, FF
Betty Rodriguez, FF
Charles Ramirez, CC
Christopher Anderson, BA
Christopher Brown, FF
Christopher Hernandez, VF
Christopher Martin, NA
Christopher Robinson, NA
Christopher Rodriguez, CB
Christopher Sanchez, DC
Daniel Anderson, DC
Daniel Brown, NA
Daniel Clark, DD
Daniel Moore, VF
Daniel Wilson, CC
David Moore, BA
Elizabeth Perez, CB
James Anderson, CC
James Gonzalez, BB
James Lee, AA
James Lewis, FF
James Miller, FF
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Mary Perez, FF
Mary Thomas, DD
Matthew Brown, DD
Matthew Lee, FF
Matthew Moore, CB
Matthew Williams, BB
Mehmet Kaya, AA
Michael Clark, FF
Michael Davis, BA
Michael Jackson, BB
Michael Perez, CC
Nancy Harris, VF
Nancy Lewis, CC
Nancy Sanchez, VF
Patricia Clark, AA
Patricia Martin, FF
Patricia Robinson, AA
Richard Clark, NA
Richard Lewis, BB
Richard Lopez, BA
Richard Thompson, AA
Robert Davis, BA
Robert Lewis, CC
Sandra Brown, FF
Sandra Perez, BB
Sarah Jackson, DC
Sarah Ramirez, BB
Sarah Rodriguez, DD
Sarah Taylor, DC
Sarah Thompson, AA
William Jones, BA
William Perez, FF
William Wilson, DD
Enter command:
Usage:
gtuStudentGrades "grades.txt"
addStudentGrade "grades.txt" "Name Surname" "AA"
searchStudent "grades.txt" "Name Surname"
sortAll "grades.txt" "name or grade"
showAll "grades.txt"
listGrades "grades.txt"
listSome "grades.txt" "numOfEntries" "pageNumber"
Enter command: searchStudent "grades.txt" "Nancy Sanchez"
Nancy Sanchez, VF
Enter command:
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Enter command: addStudentGrade "John Doe" "AA" "grades.txt"
Child process exited with status 0.
Enter command: addStudentGrade "Jasd asd" "BA" "grades.txt"
Child process exited with status 0.
Enter command:
Commands:
Usage: gtuStudentGrades <command>
  addStudentGrade "Name Surname" "Grade" "grades.txt"
  searchStudent "Name Surname" "grades.txt"
  sortAll "grades.txt"
  showAll "grades.txt"
  listGrades "grades.txt"
  listSome "numofEntries" "pageNumber" "grades.txt"
Enter command: searchStudent "John Doe" "grades.txt"
Student 's grade:  AA
Child process exited with status 0.
Enter command: sortAll "grades.txt"
Write how it will be sorted.(grade or name)
grade
1. John Doe, AA
2. Jasd asd, BA
Child process exited with status 0.
Enter command: showAll "grades.txt"
John Doe, AA
Jasd asd, BA
Child process exited with status 0.
Enter command: listGrades "grades.txt"
John Doe, AA
Jasd asd, BA
Child process exited with status 0.
Enter command: listSome "1" "1" "grades.txt"
John Doe, AA
Child process exited with status 0.
Enter command:
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[Fri Mar 22 23:43:48 2024] Task completed: Add Student Grade: John
Doe, AA
[Fri Mar 22 23:44:03 2024] Task completed: Add Student Grade: Jasd
asd, BA
[Fri Mar 22 23:44:19 2024] Task completed: Student searchedStudent
's grade:  AA

[Fri Mar 22 23:44:32 2024] Task completed: Sort All (by Grade)
[Fri Mar 22 23:44:38 2024] Task completed: Show All
[Fri Mar 22 23:44:44 2024] Task completed: List Grades (First 5)
[Fri Mar 22 23:45:06 2024] Task completed: List Some (numEntries
1, pageNumber 1)
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Enter command:
Usage:
gtuStudentGrades "grades.txt"
addStudentGrade "grades.txt" "Name Surname" "AA"
searchStudent "grades.txt" "Name Surname"
sortAll "grades.txt" "name or grade"
showAll "grades.txt"
listGrades "grades.txt"
listSome "grades.txt" "numOfEntries" "pageNumber"
Enter command: listGrades "grades.txt"
Usage:
gtuStudentGrades "grades.txt"
addStudentGrade "grades.txt" "Name Surname" "AA"
searchStudent "grades.txt" "Name Surname"
sortAll "grades.txt" "name or grade"
showAll "grades.txt"
listGrades "grades.txt"
listSome "grades.txt" "numOfEntries" "pageNumber"
Matthew Williams, BB
Patricia Robinson, AA
Daniel Moore, VF
Anthony Clark, CB
Anthony Lewis, VF
Enter command: listSome "grades.txt" "5" "2"
Usage:
gtuStudentGrades "grades.txt"
addStudentGrade "grades.txt" "Name Surname" "AA"
searchStudent "grades.txt" "Name Surname"
sortAll "grades.txt" "name or grade"
showAll "grades.txt"
listGrades "grades.txt"
listSome "grades.txt" "numOfEntries" "pageNumber"
Matthew Lee, FF
Anthony Gonzalez, NA
Betty Anderson, NA
Christopher Anderson, BA
Mary Perez, FF
Enter command:
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Patricia Robinson, AA
Karen Taylor, AA
Sarah Thompson, AA
Jessica Williams, AA
Margaret Anderson, AA
Richard Thompson, AA
John Gonzalez, AA
Patricia Clark, AA
Margaret Miller, AA
James Lee, AA
Mark Sanchez, AA
Mehmet Kaya, AA
Christopher Anderson, BA
Robert Davis, BA
Barbara Garcia, BA
William Jones, BA
Joseph Jones, BA
Anthony Smith, BA
David Moore, BA
Michael Davis, BA
Richard Lopez, BA
Matthew Williams, BB
Sarah Ramirez, BB
James Gonzalez, BB
Sandra Perez, BB
Michael Jackson, BB
Lisa Harris, BB
Mary Jackson, BB
Richard Lewis, BB
John Williams, BB
Anthony Clark, CB
Matthew Moore, CB
John Lopez, CB
Joseph Robinson, CB
Elizabeth Perez, CB
John Wilson, CB
Christopher Rodriguez, CB
Charles Ramirez, CC
Jessica Martin, CC
Michael Perez, CC
Mark Martin, CC
James Anderson, CC
Robert Lewis, CC
Daniel Wilson, CC
Nancy Lewis, CC
Joseph Rodriguez, DC
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William Wilson, DD
Barbara Lopez, DD
Sarah Rodriguez, DD
Daniel Clark, DD
Joseph Smith, DD
Mary Thomas, DD
Matthew Lee, FF
Mary Perez, FF
John Thomas, FF
Karen Lopez, FF
James Lewis, FF
Patricia Martin, FF
Christopher Brown, FF
Barbara Brown, FF
Betty Davis, FF
Sandra Brown, FF
William Perez, FF
Michael Clark, FF
Betty Rodriguez, FF
James Miller, FF
Anthony Gonzalez, NA
Betty Anderson, NA
Christopher Robinson, NA
Margaret Harris, NA
Karen Wilson, NA
Daniel Brown, NA
Barbara Williams, NA
John Davis, NA
Christopher Martin, NA
Jessica Jackson, NA
Anthony Wilson, NA
Richard Clark, NA
Daniel Moore, VF
Anthony Lewis, VF
Barbara Hernandez, VF
Jessica Brown, VF
Barbara Martin, VF
Nancy Harris, VF
Jennifer Jackson, VF
Christopher Hernandez, VF
Margaret Clark, VF
Nancy Sanchez, VF
Mark Lopez, VF
Jennifer Lopez, VF
Enter command:
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