GTU CSE344 – SYSTEM PROGRAMMING HW1 REPORT

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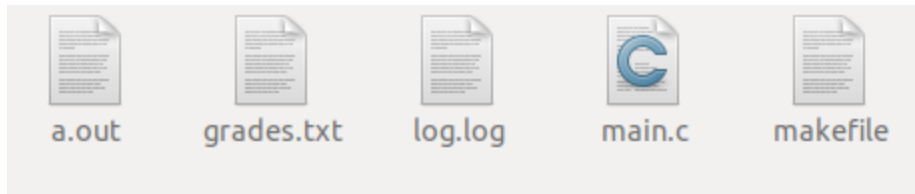
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1. Program execution details

- Execute "make" or "make all" command to compile and run the program.
- Execute "make clean" to remove non-used files (.txt, .log and .out).
- Program runs like a terminal, so you can press "q" to quit program.
- Program creates a process for every command and kills the process after it is done.

2. Example Input/Outputs

2.1


```
ra@ra-Aspire-F5-573G:~/Desktop/hw1$ make
gcc main.c
./a.out
gtuStudentGrades grades.txt
Operation finished successfully.
```

This command creates a file named "grades.txt"

a.out   grades.txt   log.log   main.c   makefile

2.2

```
addStudentGrade Dan Brown AA grades.txt
Operation finished successfully.
```

This command appends the student and grade to the end of the file.

```
≣ grades.txt
1    Dan Brown, AA
2    |
```

Example grades.txt:

```
≣ grades.txt
 1    Dan Brown, AA
 2    James Sanchez, DD
 3    Karen Taylor, AA
 4    Charles Ramirez, CC
 5    Sarah Thompson, AA
 6    Jessica Martin, CC
 7    William Jones, BA
 8    Mary Martinez, DD
 9    Jessica Brown, VF
10    Barbara Martin, VF
11    Nancy Harris, VF
12    Michael Perez, CC
13
```

2.3

```
searchStudent Barbara Martin grades.txt
Barbara Martin VF
Operation finished successfully.
```

This command returns student name surname and grade.

2.4

```
sortAll grades.txt

Sorted Student List:
Barbara Martin, VF
Charles Ramirez, CC
Dan Brown, AA
James Sanchez, DD
Jessica Brown, VF
Jessica Martin, CC
Karen Taylor, AA
Mary Martinez, DD
Michael Perez, CC
Nancy Harris, VF
Sarah Thompson, AA
William Jones, BA
Operation finished successfully.
```

This command prints all entries sorted by their names.

2.5

```
showAll grades.txt

*** Showing all students ***
Dan Brown, AA
James Sanchez, DD
Karen Taylor, AA
Charles Ramirez, CC
Sarah Thompson, AA
Jessica Martin, CC
William Jones, BA
Mary Martinez, DD
Jessica Brown, VF
Barbara Martin, VF
Nancy Harris, VF
Michael Perez, CC
Operation finished successfully.
```

This command prints all the entries in the file.

2.6

```
listGrades grades.txt

*** Showing first 5 entries ***
Dan Brown, AA
James Sanchez, DD
Karen Taylor, AA
Charles Ramirez, CC
Sarah Thompson, AA
Operation finished successfully.
```

This command prints first 5 entries in the file.

2.7

```
listSome 3 3 grades.txt

*** Showing the students in the given range ***
William Jones, BA
Mary Martinez, DD
Jessica Brown, VF
Operation finished successfully.
```

This command prints entries between a given range. In this example, it is between 7 and 9. (7th, 8th and 9th entries)

2.8

```
gtuStudentGrades

# NAME

gtuStudentGrades - Student Grade Management System with Process Creation

# SYNOPSIS

gtuStudentGrades "grades.txt"

# DESCRIPTION

gtuStudentGrades is a student grade management system implemented in C. It allows users to manage student grades stored in a file. The system provides various operations including adding student grades, se
arching for student grades, sorting student grades etc.

## Operations

1. **Add Student Grade**: Allows users to add a new student's grade to the system.

   ``addStudentGrade "Name Surname" "AA" ``

   This command appends a new student name and grade to the end of the file.

2. **Search for Student Grade**: Enables users to search for a student's grade by entering the student's name.

   ``searchStudent "Name Surname"``

   This command returns the student's name, surname, and grade if it exists in the file.

3. **Sort Student Grades**: Allows users to sort the student grades in the file.

   ``sortAll "grades.txt"``

   This command prints all entries sorted by their names in ascending order.

4. **Display Student Grades**: Enables users to display all student grades stored in the file.

   ``showAll "grades.txt" ``

   This command prints all entries in the file.

   ``listGrades "grades.txt"``

   This command prints the first 5 entries in the file.

   ``listSome "numofEntries" "pageNumber" "grades.txt"``

   This command lists entries between the specified start and end entries. For example, `listSome 5 2 grades.txt` lists entries between the 5th and 10th entries.

5. **Usage**: Displays all available commands by calling `gtuStudentGrades` without any arguments.

   ``gtuStudentGrades``

   This command without arguments lists all the instructions or information provided about how commands work in the program.
```

By calling "gtuStudentGrades" without an argument, it lists all of the instructions or information provided about how commands in my program.

3. Error Handling

The program carefully handles errors.

```
searchStudent example person grades.txt
Student not found in the file.
Operation finished successfully.
```

```
sortAll example.txt
error: No such file or directory
```

4. Logging Functionality

The program creates a log file that records the completion of each task.

```
≡ log.log
  1     - Child process completed file creation
  2     - Child process completed adding student grade
  3     - Child process completed searching student grade
  4     - Child process completed sorting student grades
  5     - Child process completed displaying student grades
  6     - Child process completed displaying student grades
  7     - Child process completed displaying student grades
  8     - Child process completed searching student grade
  9     - Failed to open file for sorting student grades
```