HW1 CSE 344
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How To Use Commands :

```
"  gtuStudentGrades “<fileName>” \"n");
"  addStudentGrade \"<studentName>\" \"<grade>\" \"<fileName>\"\n");
"  searchStudent \"<studentName>\" \"<fileName>\"\n");
"  sortAll \"<fileName>\" \"<byname>\" \"<bygrade>\"\n");
"  showAll \"<fileName>\"\n");
"  listGrades \"<fileName>\"\n");
"  listSome <numOfEntries> <pageNumber> \"<fileName>\"\n");
"  exit\n\n");
```

Examples :

```
gtuStudentGrades
gtuStudentGrades grades.txt
addStudentGrade "John Doe" "AA" "grades.txt"
searchStudent "Jane Doe"  "grades.txt"
sortAll "grades.txt" "notname" "bygrade"       // only by grade
sortAll "grades.txt" "byname" "notgrade"       // only by name
showAll "grades.txt"
listGrades "grades.txt"
listSome 2 1 "grades.txt"
exit
```

Memory leaks tested with valgrind. There is nan.

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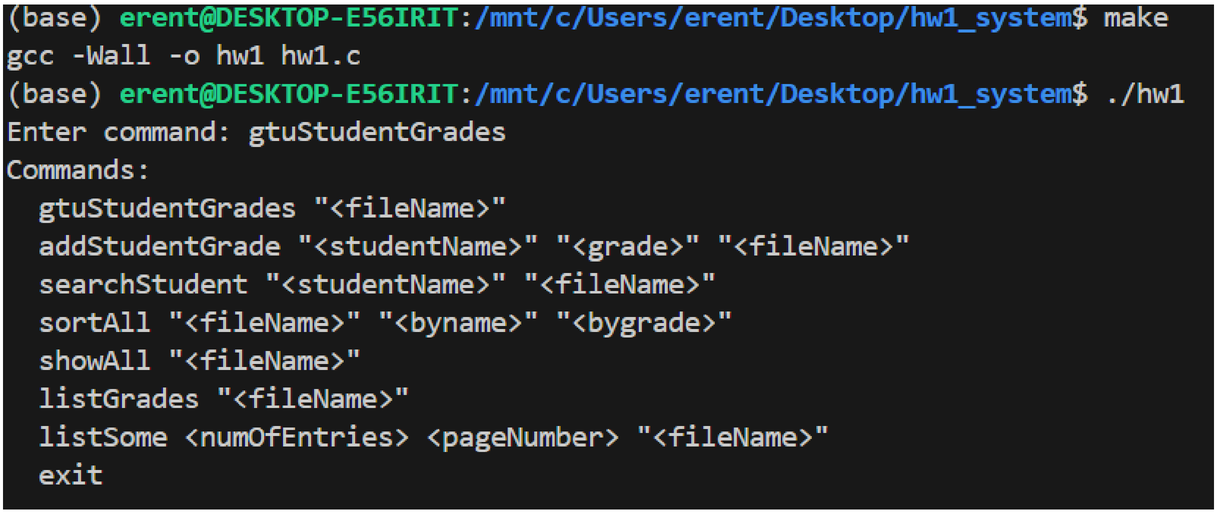
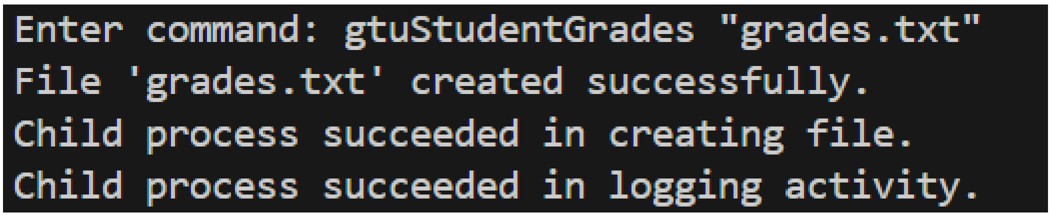
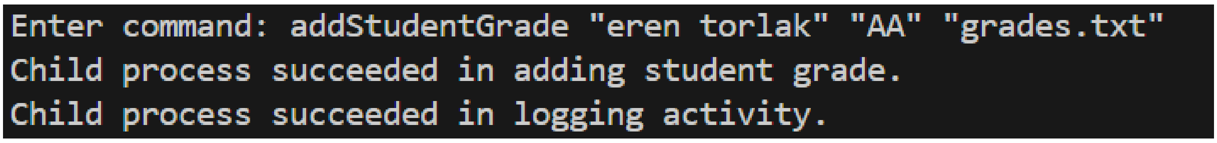


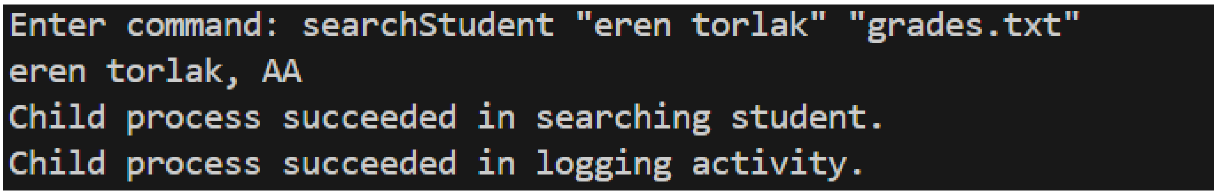
```
(base) erent@DESKTOP-E56IRIT:/mnt/c/Users/erent/Desktop/hw1_system$ make
gcc -Wall -o hw1 hw1.c
(base) erent@DESKTOP-E56IRIT:/mnt/c/Users/erent/Desktop/hw1_system$ ./hw1
Enter command: gtuStudentGrades
Commands:
  gtuStudentGrades "<fileName>"
  addStudentGrade "<studentName>" "<grade>" "<fileName>"
  searchStudent "<studentName>" "<fileName>"
  sortAll "<fileName>" "<byname>" "<bygrade>"
  showAll "<fileName>"
  listGrades "<fileName>"
  listSome <numOfEntries> <pageNumber> "<fileName>"
  exit
```



```
Enter command: gtuStudentGrades "grades.txt"
File 'grades.txt' created successfully.
Child process succeeded in creating file.
Child process succeeded in logging activity.
```



```
Enter command: addStudentGrade "eren torlak" "AA" "grades.txt"
Child process succeeded in adding student grade.
Child process succeeded in logging activity.
```



```
Enter command: searchStudent "eren torlak" "grades.txt"
eren torlak, AA
Child process succeeded in searching student.
Child process succeeded in logging activity.
```

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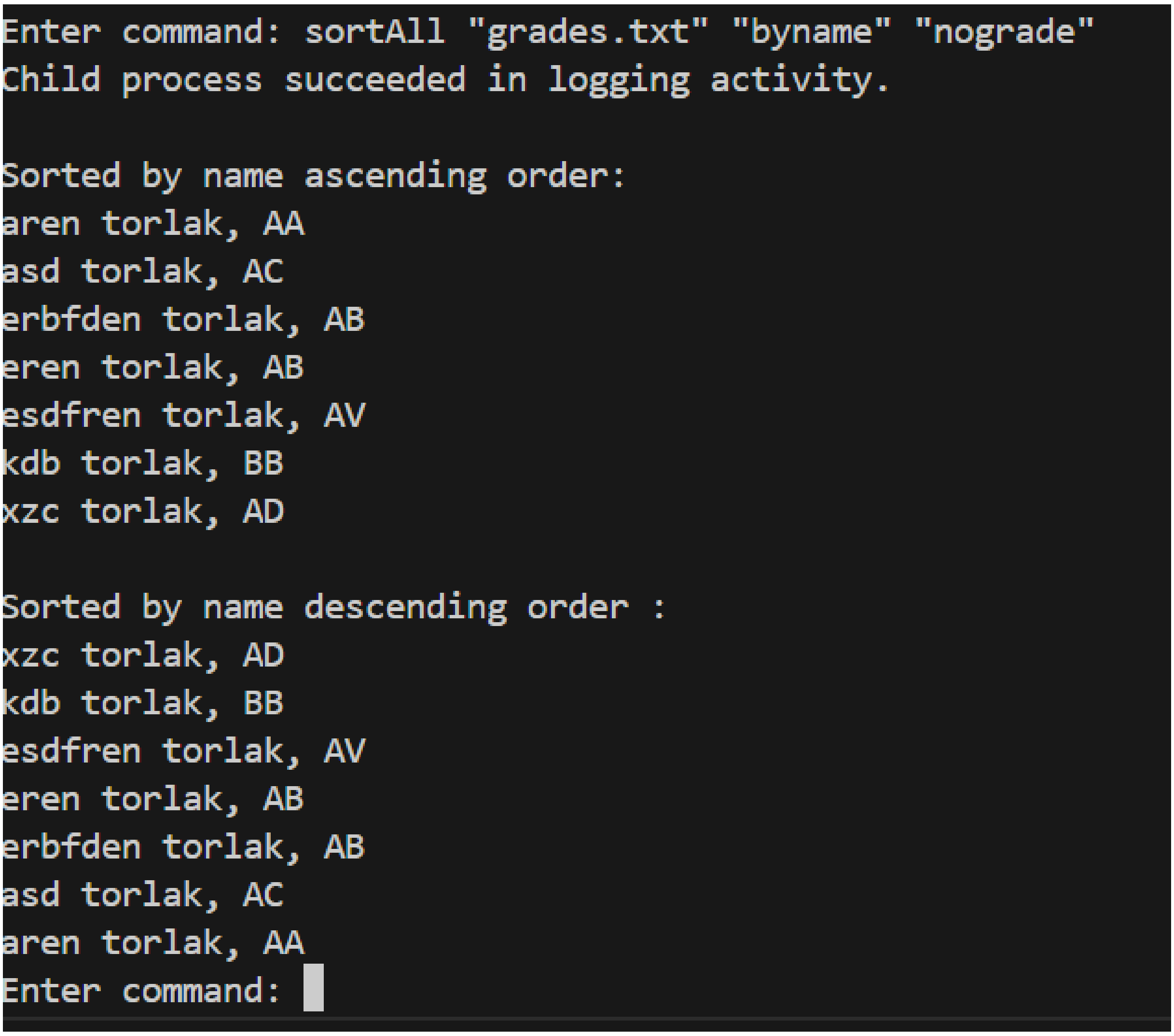

```
Enter command: sortAll "grades.txt" "byname" "nograde"
Child process succeeded in logging activity.

Sorted by name ascending order:
aren torlak, AA
asd torlak, AC
erbfden torlak, AB
eren torlak, AB
esdfren torlak, AV
kdb torlak, BB
xzc torlak, AD

Sorted by name descending order :
xzc torlak, AD
kdb torlak, BB
esdfren torlak, AV
eren torlak, AB
erbfden torlak, AB
asd torlak, AC
aren torlak, AA
Enter command: 
```

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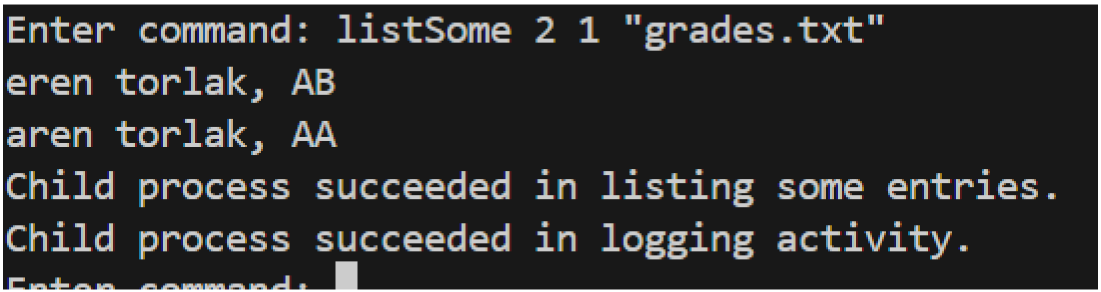
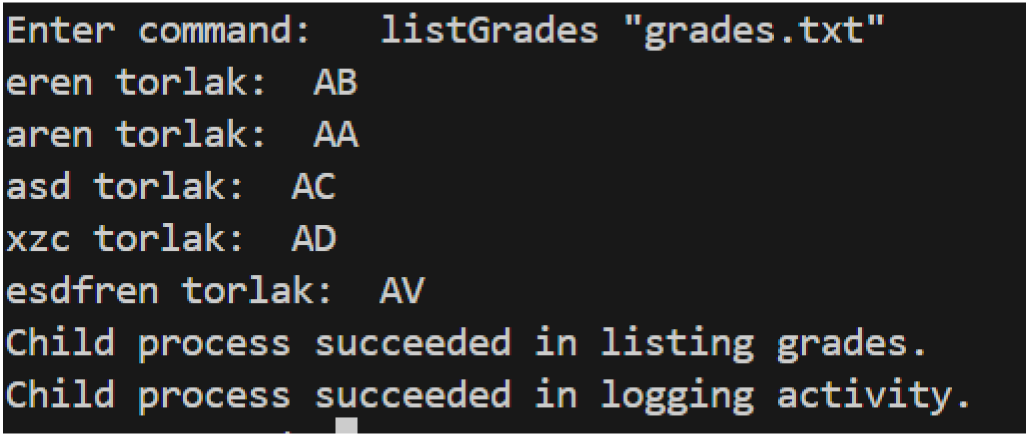


```
Enter command: listSome 2 1 "grades.txt"
eren torlak, AB
aren torlak, AA
Child process succeeded in listing some entries.
Child process succeeded in logging activity.
Enter command:
```



```
Enter command:   listGrades "grades.txt"
eren torlak:  AB
aren torlak:  AA
asd torlak:  AC
xzc torlak:  AD
esdfren torlak:  AV
Child process succeeded in listing grades.
Child process succeeded in logging activity.
```

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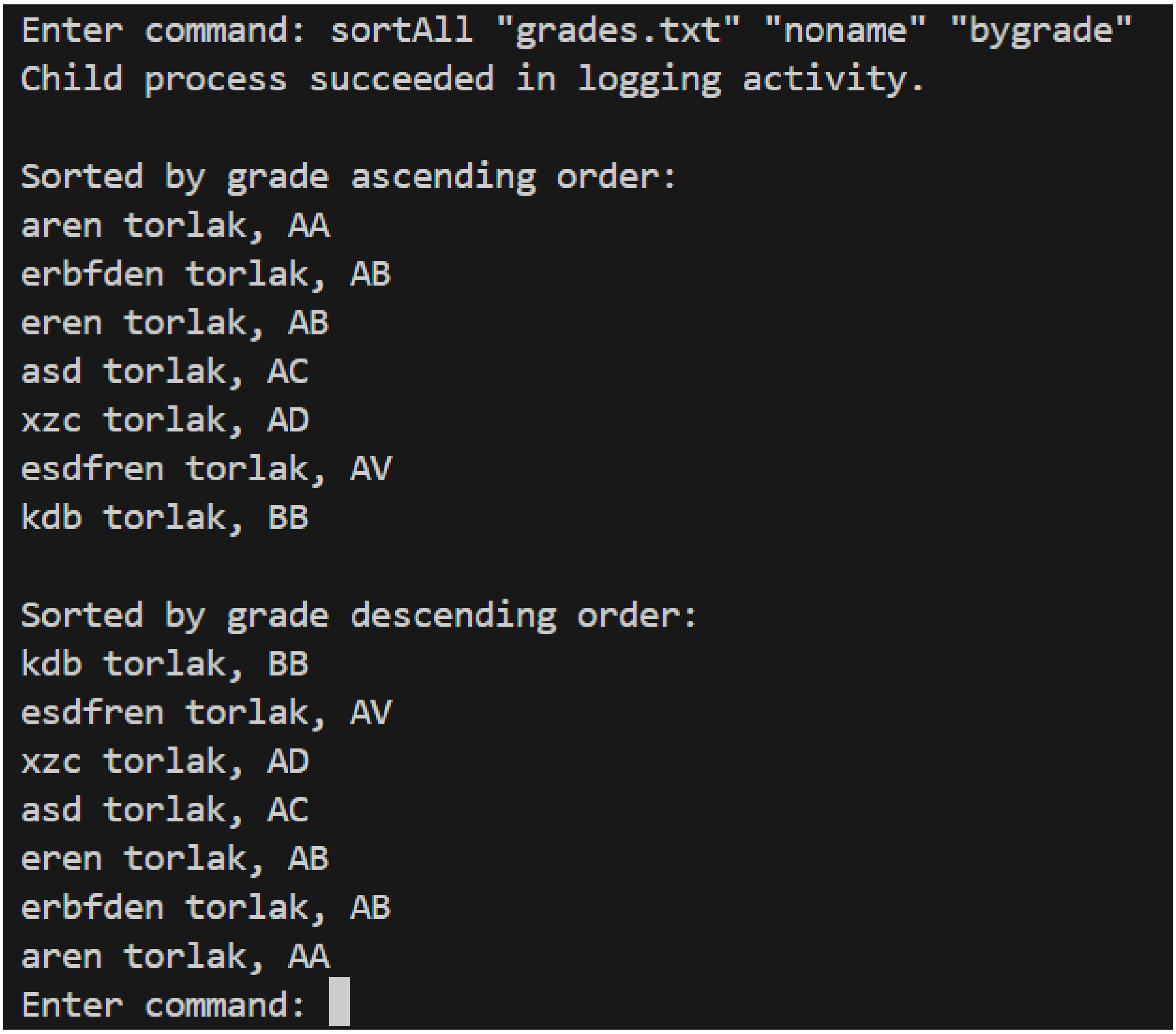
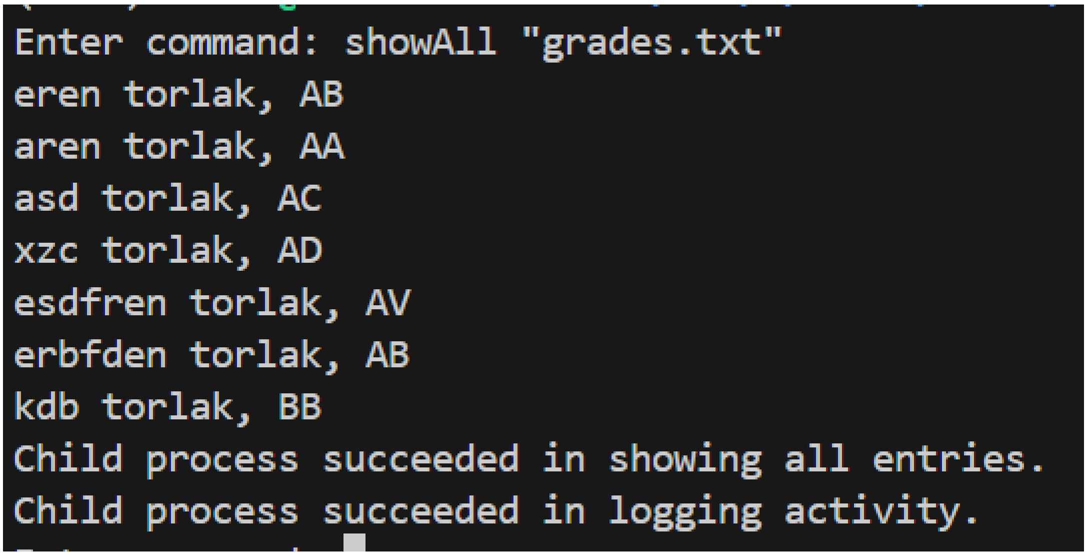


```
Enter command: sortAll "grades.txt" "noname" "bygrade"
Child process succeeded in logging activity.

Sorted by grade ascending order:
aren torlak, AA
erbfden torlak, AB
eren torlak, AB
asd torlak, AC
xzc torlak, AD
esdfren torlak, AV
kdb torlak, BB

Sorted by grade descending order:
kdb torlak, BB
esdfren torlak, AV
xzc torlak, AD
asd torlak, AC
eren torlak, AB
erbfden torlak, AB
aren torlak, AA
Enter command: 
```



```
Enter command: showAll "grades.txt"
eren torlak, AB
aren torlak, AA
asd torlak, AC
xzc torlak, AD
esdfren torlak, AV
erbfden torlak, AB
kdb torlak, BB
Child process succeeded in showing all entries.
Child process succeeded in logging activity.
```

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Function Summaries:

- *_logActivity(const char activity)_
    - Logs an activity to a predefined log file.
    - Creates a child process using **fork()**. The child process opens the log file and appends the activity text, then exits. The parent process waits for the child to finish.
- *_createFile(const char fileName)_
    - Creates a new file with the given name.
    - Uses **fork()** to create a child process that attempts to create the file. If successful, logs the creation. The parent waits for the child's completion.
- **addStudentGrade(const char *studentName, const char _grade, const char fileName)_
    - Adds a student's name and grade to a specified file.
    - A child process is spawned to append the student's name and grade to the file, and the parent waits for this process to complete before continuing.
- **searchStudent(const char _studentName, const char fileName)_
    - Searches for a student's name in a file and prints matching entries.
    - Forks a child process to read the file and search for the student. Matches are printed to stdout.
- **readLines(int fd, char _students[], int count)_
    - Reads lines from a file descriptor and stores them in an array.
    - Reads the file in chunks, splitting it into lines, and dynamically stores each line in the provided array.
- *_bubbleSortByName(char students[], int count)_
    - Sorts an array of student entries by name using bubble sort.
    - Compares adjacent items and swaps them if they are in the wrong order. Repeats this process until the array is sorted.
- *_bubbleSortByGrade(char students[], int count)_
    - Similar to **bubbleSortByName** but sorts by grade instead.
    - Grades are extracted from the end of each entry for comparison.
- **sortAll(const char *fileName, const char _isName, const char isGrade)_
    - Sorts the contents of a file by name or grade.
    - Reads all entries into memory, forks a child process to perform sorting if requested by grade, and then sorts by name in the parent process.

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- **showAll(const char fileName)*
    - Displays the contents of a file.
    - Forks a child process to read and print the entire file's content to stdout.
- **listGrades(const char fileName)*
    - Lists the grades from a file, with a maximum display limit.
    - Reads the file in a child process and prints a subset of entries.
- **listSome(int numOfEntries, int pageNumber, const char fileName)*
    - Lists a paginated subset of entries from a file.
    - Calculates the range of entries to display based on the page number and entries per page, then prints those entries.
- **displayUsage()**
    - Displays the available commands and usage instructions.
- **readUserInput_...() functions**
    - Parse and handle user input for various commands.
    - Each function is responsible for parsing specific command input and invoking the appropriate action.