

GEBZE TECHNICAL UNIVERSITY

CSE344

System Programming

Homework 1 Report

1. HOW TO RUN?

Open the terminal and navigate to the source directory. Then, compile the program by typing “**make**” and execute it using “**./gtuStudentGrades**”. Once executed, the program will produce output as specified by its functionality. To clean up generated files, use “**make clean**”, which will remove the executable and any temporary files.

2. DISPLAYING INFORMATION

To display information about available commands, simply type “**gtuStudentGrades**” without any additional arguments. This command will output the following usage information.

```
ayseguldemirbilek@Ayses-MacBook-Pro Homework1 % make
gcc -c -Wall hw1.c
gcc -Wall -o gtuStudentGrades hw1.o
ayseguldemirbilek@Ayses-MacBook-Pro Homework1 % ./gtuStudentGrades
gtuStudentGrades
gtuStudentGrades grades.txt -> File Creation
addStudentGrade "Name Surname" "AA" -> Add Student Grade
searchStudent "Name Surname" -> Search Student Grades
sortAll "grades.txt" -> Sort All Grades
showAll "grades.txt" -> Show All Grades
listGrades "grades.txt" -> List First 5 Entries
listSome "numOfEntries" "pageNumber" "grades.txt" -> List Specific Entries
```

3. FILE CREATION

To create a file, execute the program with the command **gtuStudentGrades <filename>**. Replace **<filename>** with the desired name for the file to be created.

4. ADD STUDENT GRADE

Use the command “**addStudentGrade <Name> <Grade>**” to add a student's grade. Replace **<Name>** with the student's full name (**including both name and surname**), and **<Grade>** with the corresponding grade. Error handling is done for mistyped commands.

```
sortAll "grades.txt" -> Sort All Grades
showAll "grades.txt" -> Show All Grades
listGrades "grades.txt" -> List First 5 Entries
listSome "numOfEntries" "pageNumber" "grades.txt" -> List Specific Entries
gtuStudentGrades grades.txt
addStudentGrade Ayse Gul AA
addStudentGrade Sevgi Oz CC
addStudentGrade Merve Erik DC
addStudentGrade Selo Can BA
addStudentGrade Ahmet Dertli FF
addStudentGrade Sezen Aksu CB
addstudentgrade Hülya Gok BB
Invalid command: addstudentgrade
```

The file after this operations;

```
Homework1 > ⚙ grades.txt
1  Ayse Gul AA
2  Sevgi Oz CC
3  Merve Erik DC
4  Selo Can BA
5  Ahmet Dertli FF
6  ✨ Sezen Aksu CB
7
```

5. SEARCH STUDENT GRADES

To search for a student's grades, run the command **searchStudent <Name>**. Replace **<Name>** with the full name of the student you want to search for. Still invalid commands are detected and if the student is not in the list user is informed.

```
addStudentGrade Sezen Aksu CB
addstudentgrade Hülya Gok BB
Invalid command: addstudentgrade
searchStudent Ayse Gul
Ayse Gul AA
searchStudent Selo Can
Selo Can BA
searchStudent Hülya Gok
Student not found.
searchStudent Sezen Aksu
Sezen Aksu CB
searchStudent Ahmet Dertli
Ahmet Dertli FF
searchStudentGrade Merve Erik
Invalid command: searchStudentGrade
searchStudent Merve Erik
Merve Erik DC
```

6. SHOW ALL GRADES

Use the command **showAll <filename>** to display all student grades stored in the specified file.

```
PROBLEMS  OUTPUT  TERMINAL  PORTS  COMMENTS  DEBUG

showAll grades.txt
Ayse Gul AA
Sevgi Oz CC
Merve Erik DC
Selo Can BA
Ahmet Dertli FF
Sezen Aksu CB
```

7. SORT ALL GRADES

Execute the command `sortAll "<filename>"`, followed by choosing the sorting criteria (1 for sorting by name, 2 for sorting by grade) and the sorting order (1 for ascending, 2 for descending) when prompted.

```
searchStudentGrade Merve Erik
Invalid command: searchStudentGrade
searchStudent Merve Erik
Merve Erik DC
sortAll grades.txt
Enter 1 for sorting by name or 2 for sorting by grade: 1
Enter 1 for ascending order or 2 for descending order: 1
Sorting by name in ascending order...
Sorted grades:
Ahmet Dertli FF
Ayse Gul AA
Merve Erik DC
Selo Can BA
Sevgi Oz CC
Sezen Aksu CB
sortAll grades.txt
Enter 1 for sorting by name or 2 for sorting by grade: 1
Enter 1 for ascending order or 2 for descending order: 2
Sorting by name in descending order...
Sorted grades:
Sezen Aksu CB
Sevgi Oz CC
Selo Can BA
Merve Erik DC
Ayse Gul AA
Ahmet Dertli FF
sortAll grades.txt
Enter 1 for sorting by name or 2 for sorting by grade: 2
Enter 1 for ascending order or 2 for descending order: 2
Sorting by grade in descending order...
Sorted grades:
Ahmet Dertli FF
Merve Erik DC
Sevgi Oz CC
Sezen Aksu CB
Selo Can BA
Ayse Gul AA
sortAll grades.txt
Enter 1 for sorting by name or 2 for sorting by grade: 2
Enter 1 for ascending order or 2 for descending order: 1
Sorting by grade in ascending order...
Sorted grades:
Ayse Gul AA
Selo Can BA
Sezen Aksu CB
Sevgi Oz CC
Merve Erik DC
Ahmet Dertli FF
```

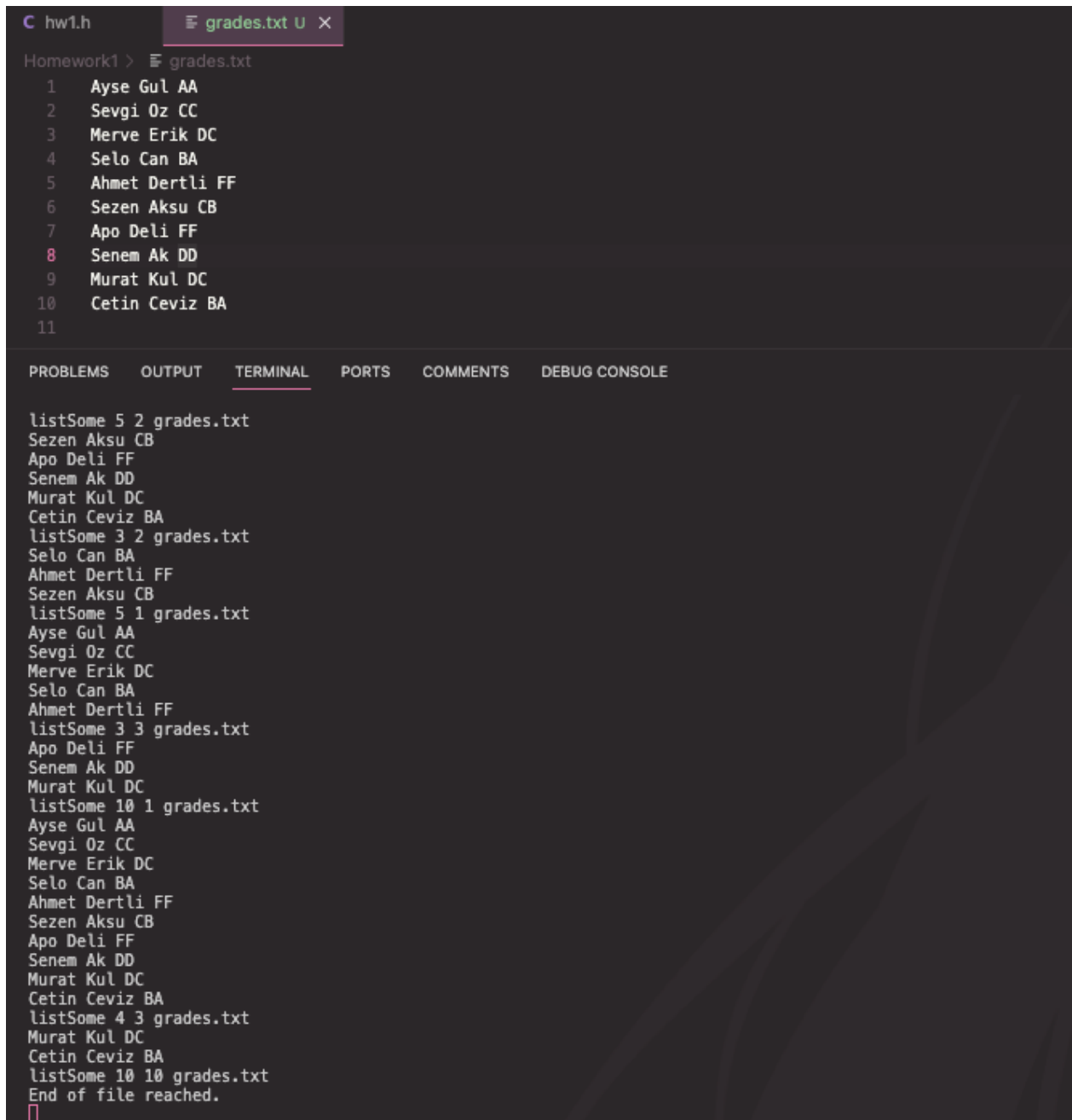
8. LIST 5 FIRST ENTRIES

To list the first 5 entries of the grades, run **listGrades <filename>**.

```
addStudentGrade Apo Deli FF
addStudentGrade Senem Ak DD
addStudentGrade Murat Kul DC
addStudentGrade Cetin Ceviz BA
listGrades grades.txt
Ayse Gul AA
Sevgi Oz CC
Merve Erik DC
Selo Can BA
Ahmet Dertli FF
█
```

9. LIST ENTRIES IN A SPECIFIED PAGE

Execute the command **listSome <numOfEntries> <pageNumber> <filename>**. Replace **<numOfEntries>** with the number of entries per page, **<pageNumber>** with the desired page number, and **<filename>** with the file containing the grades.



The screenshot shows a code editor with two tabs: 'hw1.h' and 'grades.txt'. The 'grades.txt' tab is active, displaying a list of 10 entries, each with a line number from 1 to 10. The entries are: 1 Ayse Gul AA, 2 Sevgi Oz CC, 3 Merve Erik DC, 4 Selo Can BA, 5 Ahmet Dertli FF, 6 Sezen Aksu CB, 7 Apo Deli FF, 8 Senem Ak DD, 9 Murat Kul DC, 10 Cetin Ceviz BA. Below the editor, the 'TERMINAL' tab is active, showing the output of several 'listSome' commands. The commands and their outputs are: 'listSome 5 2 grades.txt' outputs 'Sezen Aksu CB', 'Apo Deli FF', 'Senem Ak DD', 'Murat Kul DC', 'Cetin Ceviz BA'; 'listSome 3 2 grades.txt' outputs 'Selo Can BA', 'Ahmet Dertli FF', 'Sezen Aksu CB'; 'listSome 5 1 grades.txt' outputs 'Ayse Gul AA', 'Sevgi Oz CC', 'Merve Erik DC', 'Selo Can BA', 'Ahmet Dertli FF'; 'listSome 3 3 grades.txt' outputs 'Apo Deli FF', 'Senem Ak DD', 'Murat Kul DC'; 'listSome 10 1 grades.txt' outputs 'Ayse Gul AA', 'Sevgi Oz CC', 'Merve Erik DC', 'Selo Can BA', 'Ahmet Dertli FF', 'Sezen Aksu CB', 'Apo Deli FF', 'Senem Ak DD', 'Murat Kul DC', 'Cetin Ceviz BA'; 'listSome 4 3 grades.txt' outputs 'Murat Kul DC', 'Cetin Ceviz BA'; and 'listSome 10 10 grades.txt' outputs 'End of file reached.'.

```
hw1.h grades.txt U X
Homework1 > grades.txt
1 Ayse Gul AA
2 Sevgi Oz CC
3 Merve Erik DC
4 Selo Can BA
5 Ahmet Dertli FF
6 Sezen Aksu CB
7 Apo Deli FF
8 Senem Ak DD
9 Murat Kul DC
10 Cetin Ceviz BA
11

PROBLEMS OUTPUT TERMINAL PORTS COMMENTS DEBUG CONSOLE

listSome 5 2 grades.txt
Sezen Aksu CB
Apo Deli FF
Senem Ak DD
Murat Kul DC
Cetin Ceviz BA
listSome 3 2 grades.txt
Selo Can BA
Ahmet Dertli FF
Sezen Aksu CB
listSome 5 1 grades.txt
Ayse Gul AA
Sevgi Oz CC
Merve Erik DC
Selo Can BA
Ahmet Dertli FF
listSome 3 3 grades.txt
Apo Deli FF
Senem Ak DD
Murat Kul DC
listSome 10 1 grades.txt
Ayse Gul AA
Sevgi Oz CC
Merve Erik DC
Selo Can BA
Ahmet Dertli FF
Sezen Aksu CB
Apo Deli FF
Senem Ak DD
Murat Kul DC
Cetin Ceviz BA
listSome 4 3 grades.txt
Murat Kul DC
Cetin Ceviz BA
listSome 10 10 grades.txt
End of file reached.
```

10. LOGGING

Parent process keep the log of commands and saves the PID's of both children and itself. Here's content of the log file.

```
System-Programming-CSE344

C hw1.c  log.txt U X  M makefile  C hw1.h  ...  log.txt U X

Homework1 > log.txt
1 Parent process (PID: 82957) waited for child process (PID: 83002) with exit status: 0
2 Command executed: gtuStudentGrades
3 Parent process (PID: 82957) waited for child process (PID: 84372) with exit status: 0
4 Command executed: gtuStudentGrades grades.txt
5 Parent process (PID: 82957) waited for child process (PID: 85513) with exit status: 0
6 Command executed: addStudentGrade Ayse Gul AA
7 Parent process (PID: 82957) waited for child process (PID: 85676) with exit status: 0
8 Command executed: addStudentGrade Sevgi Oz CC
9 Parent process (PID: 82957) waited for child process (PID: 85770) with exit status: 0
10 Command executed: addStudentGrade Merve Erik DC
11 Parent process (PID: 82957) waited for child process (PID: 85858) with exit status: 0
12 Command executed: addStudentGrade Selo Can BA
13 Parent process (PID: 82957) waited for child process (PID: 85937) with exit status: 0
14 Command executed: addStudentGrade Ahmet Dertli FF
15 Parent process (PID: 82957) waited for child process (PID: 86051) with exit status: 0
16 Command executed: addStudentGrade Sezen Aksu CB
17 Parent process (PID: 82957) waited for child process (PID: 86181) with exit status: 0
18 Command executed: addStudentGrade Hülya Gok BB
19 Parent process (PID: 82957) waited for child process (PID: 89454) with exit status: 0
20 Command executed: searchStudent Ayse Gul
21 Parent process (PID: 82957) waited for child process (PID: 89515) with exit status: 0
22 Command executed: searchStudent Selo Can
23 Parent process (PID: 82957) waited for child process (PID: 89581) with exit status: 0
24 Command executed: searchStudent Hülya Gok
25 Parent process (PID: 82957) waited for child process (PID: 89778) with exit status: 0
26 Command executed: searchStudent Sezen Aksu
27 Parent process (PID: 82957) waited for child process (PID: 89847) with exit status: 0
28 Command executed: searchStudent Ahmet Dertli
29 Parent process (PID: 82957) waited for child process (PID: 89950) with exit status: 0
30 Command executed: searchStudentGrade Merve Erik
31 Parent process (PID: 82957) waited for child process (PID: 90057) with exit status: 0
32 Command executed: searchStudent Merve Erik
33 Parent process (PID: 82957) waited for child process (PID: 91220) with exit status: 0
34 Command executed: sortAll grades.txt
35 Parent process (PID: 82957) waited for child process (PID: 91308) with exit status: 0
36 Command executed: sortAll grades.txt
37 Parent process (PID: 82957) waited for child process (PID: 91414) with exit status: 0
38 Command executed: sortAll grades.txt
39 Parent process (PID: 82957) waited for child process (PID: 91555) with exit status: 0
40 Command executed: sortAll grades.txt

PROBLEMS OUTPUT TERMINAL PORTS COMMENTS DEBUG CONSOLE

Sevgi Oz CC
Merve Erik DC
Selo Can BA
Ahmet Dertli FF
listSome 3 3 grades.txt
Apo Deli FF
Senem Ak DD
Murat Kul DC
listSome 10 1 grades.txt
Ayse Gul AA
Sevgi Oz CC
Merve Erik DC
Selo Can BA
Ahmet Dertli FF
Sezen Aksu CB
Apo Deli FF
Senem Ak DD
Murat Kul DC
Cetin Ceviz BA
listSome 4 3 grades.txt
Murat Kul DC
Cetin Ceviz BA
listSome 10 10 grades.txt
End of file reached.
exit
ayseguldemirbilek@Ayses-MacBook-Pro Homework1 %
```