GEBZE TECHNICAL UNIVERSITY

COMPUTER ENGINEERING

SPRING 2021 - CSE 344

SYSTEM PROGRAMMING

HOMEWORK 1

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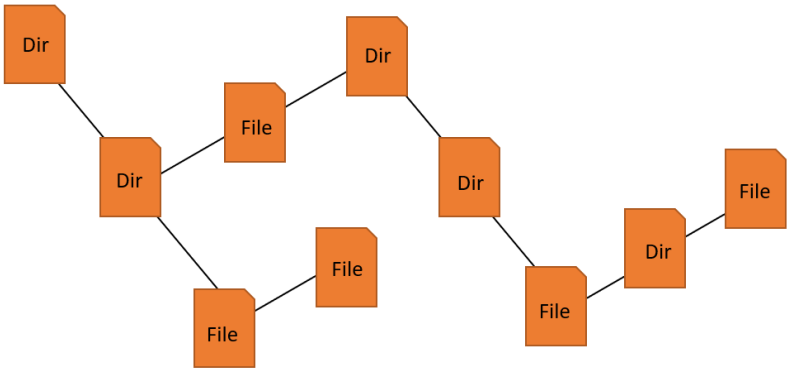
In this assignment, I implemented 2 data structures to accomplish the given task. One is a data transfer object (DTO) for query parameters to be passed between functions, and the other is a binary tree to represent the file structure as storing one node for sibling file/directory and one node for child directories.



At first, I parsed given command line string using getopt function and stored gathered data into a f_params struct. Then traversed given file path recursively if it current node is a directory. Then I created a node to represent the file and linked it to the main tree if it satisfies given criteria. After binary tree has been created, I implemented a depth first traversal algorithm with a very simple recursive function and printed every node using that algorithm. Then I called helper functions to free allocated memory space.

Example output:

Example valgrind output:

```
|--q4.prolog
|--part1.c
|--midterm.lisp
|--q3.prolog
|--sevval
|----part4.c
|----part3.txt
|----part2.c
|----part1.c
|--Homework 3 part2
|-----.classpath
|-----.settings
|------org.eclipse.jdt.core.prefs
|----SimpleTextEditor.class
|----Main.class
|----input
|------input_text_2.txt
|------input_text.txt
|----Homework 3 part2.ucls
|----logs
|------log_file.log
|-----.project
|----Main.java
|----SimpleTextEditor.java
|--q2.prolog
|--hw3
|--q1
==14964== Invalid free() / delete / delete[] / realloc()
==14964==    at 0x4C3389F: free (vg_replace_malloc.c:755)
==14964==    by 0x108CF6: free_params (in /home/user/Desktop/cse_344/hw1)
==14964==    by 0x109ED9: main (in /home/user/Desktop/cse_344/hw1)
==14964==  Address 0x5233040 is 0 bytes inside a block of size 19 free'd
==14964==    at 0x4C3389F: free (vg_replace_malloc.c:755)
==14964==    by 0x108DB9: free_tree (in /home/user/Desktop/cse_344/hw1)
==14964==    by 0x109EC1: main (in /home/user/Desktop/cse_344/hw1)
==14964==  Block was alloc'd at
==14964==    at 0x4C30FB5: malloc (vg_replace_malloc.c:380)
==14964==    by 0x109069: get_params (in /home/user/Desktop/cse_344/hw1)
==14964==    by 0x109E37: main (in /home/user/Desktop/cse_344/hw1)
==14964==
==14964==
==14964== HEAP SUMMARY:
==14964==     in use at exit: 0 bytes in 0 blocks
==14964==   total heap usage: 47,390 allocs, 47,391 frees, 56,621,072 bytes allocated
==14964==
==14964== All heap blocks were freed -- no leaks are possible
==14964==
==14964== For lists of detected and suppressed errors, rerun with: -s
==14964== ERROR SUMMARY: 1 errors from 1 contexts (suppressed: 0 from 0)
user@ubuntu:~/Desktop/cse_344$
```