

File Explorer Application with Enhanced File History and Log Tracking

```
/*
-----
-
SIMPLE CONSOLE FILE EXPLORER (WITH ACTIVITY LOG)
-----
-
Author : Abhisekh k Panigrahy
Purpose : A small command-line file explorer that allows
          users to perform common file operations such as
          create, delete, copy, move, list, and search.
          It also keeps a log of all performed actions.
-----
-
*/
#include <iostream>
#include <fstream>
#include <string>
#include <vector>
#include <sstream>
#include <dirent.h>
#include <sys/stat.h>
#include <cstdio>
#include <cstring>
#include <cstdlib>
#include <ctime>
#include <unistd.h>

#ifndef _WIN32
#include <windows.h>
#define PATH_SEP '\\'
#else
#define PATH_SEP '/'
#endif
```

```

using namespace std;

/*
----- Write each action performed by user to a log file -----
*/
void logAction(const string &action) {
    ofstream log("activity_log.txt", ios::app);
    if (!log) return;

    time_t now = time(NULL);
    tm *t = localtime(&now);

    char timeStr[64];
    strftime(timeStr, sizeof(timeStr), "%Y-%m-%d %H:%M:%S", t);

    log << "[" << timeStr << "] " << action << endl;
    log.close();
}

/*
----- Split input line into words -----
*/
vector<string> split(const string &line) {
    stringstream ss(line);
    string word;
    vector<string> parts;
    while (ss >> word)
        parts.push_back(word);
    return parts;
}

/*
----- Check if path refers to a directory -----
*/
bool isDirectory(const string &path) {
    struct stat st;
    if (stat(path.c_str(), &st) == 0)
        return (st.st_mode & S_IFDIR);
    return false;
}

```

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}

/*
    List all files and folders in a directory
-----*/
void listFiles(const string &path = ".") {
    DIR *dir = opendir(path.c_str());
    if (!dir) {
        perror("ls");
        return;
    }

    cout << "Contents of " << path << ":\n";
    struct dirent *entry;
    while ((entry = readdir(dir)) != NULL) {
        string name = entry->d_name;
        if (name == "." || name == "..") continue;

        string fullPath = path + PATH_SEP + name;
        struct stat st;
        if (stat(fullPath.c_str(), &st) == 0) {
            if (isDirectory(fullPath))
                cout << "[DIR] ";
            else
                cout << "          ";
            cout << name << "\t(" << st.st_size << " bytes)\n";
        }
    }
    closedir(dir);
    logAction("Listed contents of: " + path);
}

/*
    Change current working directory
-----*/
void changeDir(const string &path) {
    if (chdir(path.c_str()) == 0) {
        cout << "Changed directory to: " << path << endl;
        logAction("Changed directory to: " + path);
    } else {

```

```

        perror("cd");
    }
}

/*-----*
 * Print current working directory path
-----*/
void printPwd() {
    char cwd[1024];
    if (getcwd(cwd, sizeof(cwd)))
        cout << cwd << endl;
    else
        perror("pwd");

    logAction("Checked current directory.");
}

/*-----*
 * Copy a file from one location to another
-----*/
bool copyFile(const string &src, const string &dest) {
    FILE *in = fopen(src.c_str(), "rb");
    if (!in) return false;

    FILE *out = fopen(dest.c_str(), "wb");
    if (!out) {
        fclose(in);
        return false;
    }

    char buffer[4096];
    size_t n;
    while ((n = fread(buffer, 1, sizeof(buffer), in)) > 0)
        fwrite(buffer, 1, n, out);

    fclose(in);
    fclose(out);
    logAction("Copied file: " + src + " -> " + dest);
    return true;
}

```

```

/*
 *-----*
 *-----* Delete a file or folder (recursively)
 *-----*
void removeRecursive(const string &path) {
    if (isDirectory(path)) {
        DIR *dir = opendir(path.c_str());
        if (!dir) return;
        struct dirent *entry;

        while ((entry = readdir(dir)) != NULL) {
            string name = entry->d_name;
            if (name == "." || name == "..") continue;
            string subPath = path + PATH_SEP + name;
            removeRecursive(subPath);
        }
        closedir(dir);
    }

#ifndef _WIN32
    _rmdir(path.c_str());
#else
    rmdir(path.c_str());
#endif
} else {
    remove(path.c_str());
}
logAction("Removed: " + path);
}

/*
 *-----*
 *-----* Search for a file by name (recursive)
 *-----*
/*-----*
 *-----* Search for a file by name (recursive)
 *-----*
 Shows full absolute path
 Displays message if no match is found
 *-----*/
void searchFile(const string &pattern, const string &path =
".") {
    DIR *dir = opendir(path.c_str());

```

```

if (!dir) return;

struct dirent *entry;
bool found = false; // Track if any file matched

while ((entry = readdir(dir)) != NULL) {
    string name = entry->d_name;
    if (name == "." || name == "..") continue;

    string fullPath = path + PATH_SEP + name;
    struct stat st;

    if (stat(fullPath.c_str(), &st) != 0)
        continue;

    // If name matches pattern, print absolute path
    if (name.find(pattern) != string::npos) {
        found = true;

        char absPath[1024];
#ifdef _WIN32
        _fullpath(absPath, fullPath.c_str(),
        sizeof(absPath));
#else
        realpath(fullPath.c_str(), absPath);
#endif
        cout << absPath << endl;
    }

    // Continue searching inside subdirectories
    if (isDirectory(fullPath))
        searchFile(pattern, fullPath);
}

closedir(dir);

// If nothing found and this is the top-level call
if (path == "." && !found)
    cout << "No file found matching: " << pattern << endl;

```

```

        logAction("Searched for: " + pattern + " in " + path);
    }

/*
----- Create an empty file (similar to Linux 'touch')
-----*/
void touchFile(const string &path) {
    FILE *f = fopen(path.c_str(), "ab");
    if (f) {
        fclose(f);
        cout << "File created/updated: " << path << endl;
        logAction("Created or updated file: " + path);
    } else {
        perror("touch");
    }
}

/*
----- Create a new folder
-----*/
void makeDir(const string &path) {
#ifdef _WIN32
    if (.CreateDirectoryA(path.c_str(), NULL))
        cout << "Directory created: " << path << endl;
    else
        perror("mkdir");
#else
    if (mkdir(path.c_str(), 0755) == 0)
        cout << "Directory created: " << path << endl;
    else
        perror("mkdir");
#endif
    logAction("Created directory: " + path);
}

/*
----- Move or rename a file
-----*/
void moveFile(const string &src, const string &dest) {
    if (rename(src.c_str(), dest.c_str()) == 0) {

```

```

        cout << "Moved: " << src << " -> " << dest << endl;
        logAction("Moved/Renamed: " + src + " -> " + dest);
    } else {
        perror("mv");
    }
}

/*
----- Show all previously logged activities -----
*/
void showHistory() {
    ifstream log("activity_log.txt");
    if (!log) {
        cout << "No activity history found yet.\n";
        return;
    }

    cout << "----- ACTIVITY LOG -----\\n";
    string line;
    while (getline(log, line))
        cout << line << endl;
    cout << "-----\\n";
    log.close();
}

/*
----- Display list of available commands -----
*/
void showHelp() {
    cout << "\\nAvailable Commands:\\n";
    cout << "  ls [path]          - List files and folders\\n";
    cout << "  cd <dir>           - Change directory\\n";
    cout << "  pwd                 - Print current directory\\n";
    cout << "  cp <src> <dest>     - Copy file\\n";
    cout << "  mv <src> <dest>     - Move or rename file\\n";
    cout << "  rm <path>           - Delete file/folder\\n";
    cout << "  touch <file>         - Create empty file\\n";
    cout << "  mkdir <dir>          - Create new folder\\n";
    cout << "  search <name>        - Search file by name\\n";
    cout << "  history              - Show activity log\\n";
}

```

```

        cout << " help           - Show help menu\n";
        cout << " exit          - Exit explorer\n\n";
    }

/*
----- MAIN PROGRAM -----
*/
int main() {
    cout << "-----\n";
    cout << "  SIMPLE CONSOLE FILE EXPLORER (C++ / GCC6)\n";
    cout << "-----\n";
    cout << "Type 'help' to see available commands.\n\n";

    string line;
    while (true) {
        char cwd[1024];
        getcwd(cwd, sizeof(cwd));
        cout << cwd << " $ ";

        if (!getline(cin, line)) break;
        vector<string> args = split(line);
        if (args.empty()) continue;

        string cmd = args[0];

        if (cmd == "exit" || cmd == "quit")
            break;
        else if (cmd == "help")
            showHelp();
        else if (cmd == "ls")
            listFiles(args.size() > 1 ? args[1] : ".");
        else if (cmd == "cd") {
            if (args.size() > 1) changeDir(args[1]);
            else cout << "Usage: cd <dir>\n";
        }
        else if (cmd == "pwd")
            printPwd();
        else if (cmd == "cp") {
            if (args.size() > 2) {
                if (copyFile(args[1], args[2]))

```

```

        cout << "Copied: " << args[1] << " -> " <<
args[2] << endl;
    else
        perror("cp");
} else cout << "Usage: cp <src> <dest>\n";
}
else if (cmd == "mv") {
    if (args.size() > 2)
        moveFile(args[1], args[2]);
else
    cout << "Usage: mv <src> <dest>\n";
}
else if (cmd == "rm") {
    if (args.size() > 1)
        removeRecursive(args[1]);
else
    cout << "Usage: rm <path>\n";
}
else if (cmd == "touch") {
    if (args.size() > 1)
        touchFile(args[1]);
else
    cout << "Usage: touch <file>\n";
}
else if (cmd == "mkdir") {
    if (args.size() > 1)
        makeDir(args[1]);
else
    cout << "Usage: mkdir <dir>\n";
}
else if (cmd == "search") {
    if (args.size() > 1)
        searchFile(args[1]);
else
    cout << "Usage: search <pattern>\n";
}
else if (cmd == "history")
    showHistory();
else
    cout << "Unknown command. Type 'help' for list.\n";

```

```
}

cout << "\nGoodbye! Have a nice day :)\n";
return 0;
}
```

SCREENSHOTS

This screenshot shows a code editor interface with a terminal window open. The terminal window displays the following error message:

```
D:\Uncharted\4\My_ASSIGNMENT-1>g++ MY_PROJECT.cpp -o MY_PROJECT.exe
c:/mingw/bin/../lib/gcc/mingw32/6.3.0/../../../../mingw32/bin/ld.exe: cannot open output file MY_PROJECT.exe: Permission denied
collect2.exe: error: ld returned 1 exit status
```

The terminal window also shows the current working directory as D:\Uncharted\4\My_ASSIGNMENT-1.

This screenshot shows a code editor interface with a terminal window open. The terminal window displays the following output after compilation:

```
D:\Uncharted\4\My_ASSIGNMENT-1>g++ MY_PROJECT.cpp -o MY_PROJECT.exe
D:\Uncharted\4\My_ASSIGNMENT-1>MY_PROJECT.exe
```

Below the terminal window, a message from the application states:

```
-----  
SIMPLE CONSOLE FILE EXPLORER (WITH ACTIVITY LOG)  
-----  
Author : Abhishek k Panigrahy  
Purpose : A small command-line file explorer that allows  
users to perform common file operations such as  
create, delete, copy, move, list, and search.  
It also keeps a log of all performed actions.
```

The terminal window also shows the current working directory as D:\Uncharted\4\My_ASSIGNMENT-1.

The screenshot shows the Visual Studio Code interface with the following details:

- File Explorer:** Shows files in the 'MY_ASSIGNMENT-1' folder: 'activity.log.txt', 'MY_PROJECT.cpp' (selected), 'MY_PROJECT.exe', and 'newfile.txt'.
- Terminal:** Displays the output of a build and run process:

```
Microsoft Windows [Version 10.0.26200.7019]
(c) Microsoft Corporation. All rights reserved.

D:\Uncharted\4\MY_ASSIGNMENT-1>g++ MY_PROJECT.cpp -o MY_PROJECT.exe
D:\Uncharted\4\MY_ASSIGNMENT-1>MY_PROJECT.exe
-----
SIMPLE CONSOLE FILE EXPLORER (C++ / GCC6)
-----
Type 'help' to see available commands.

D:\Uncharted\4\MY_ASSIGNMENT-1 $ touch newfile.txt
File created/updated: newfile.txt
D:\Uncharted\4\MY_ASSIGNMENT-1 $
```
- Status Bar:** Shows 'Ln 5, Col 36' and other standard build and run status indicators.

The screenshot shows the Visual Studio Code interface with the following details:

- File Explorer:** Shows files in the 'MY_ASSIGNMENT-1' folder: 'newfolder', 'activity.log.txt', 'MY_PROJECT.cpp' (selected), 'MY_PROJECT.exe', and 'newfile.txt'.
- Terminal:** Displays the output of a build and run process:

```
Microsoft Windows [Version 10.0.26200.7019]
(c) Microsoft Corporation. All rights reserved.

D:\Uncharted\4\MY_ASSIGNMENT-1>g++ MY_PROJECT.cpp -o MY_PROJECT.exe
D:\Uncharted\4\MY_ASSIGNMENT-1>MY_PROJECT.exe
-----
SIMPLE CONSOLE FILE EXPLORER (C++ / GCC6)
-----
void showHelp() {
    cout << "\nAvailable Commands:\n";
    cout << " ls [path]          - List files and folders\n";
    cout << " cd <dir>           - Change directory\n";
    cout << " pwd                 - Print current directory\n";
    cout << " cp <src> <dest>   - Copy file\n";
    cout << " mv <src> <dest>   - Move or rename file\n";
    cout << " rm <path>            - Delete file/folder\n";
    cout << " touch <file>         - Create empty file\n";
    cout << " mkdir <dir>           - Create new folder\n";
    cout << " search <name>        - Search file by name\n";
    cout << " history              - Show activity log\n";
    cout << " help                  - Show help menu\n";
    cout << " exit                  - Exit explorer\n\n";
}

D:\Uncharted\4\MY_ASSIGNMENT-1 $ touch newfile.txt
File created/updated: newfile.txt
D:\Uncharted\4\MY_ASSIGNMENT-1 $ mkdir newfolder
Directory created: newfolder
D:\Uncharted\4\MY ASSIGNMENT-1 $
```
- Status Bar:** Shows 'Ln 5, Col 36' and other standard build and run status indicators.

```
D:\Uncharted 4\MY_ASSIGNMENT-1 $ touch newfile.txt
File created/updated: newfile.txt
D:\Uncharted 4\MY_ASSIGNMENT-1 $ mkdir newfolder
Directory created: newfolder
D:\Uncharted 4\MY_ASSIGNMENT-1 $ ls
Contents of .:
    activity_log.txt (112 bytes)
    MY_PROJECT.cpp (11254 bytes)
    MY_PROJECT.exe (103280 bytes)
    newfile.txt (0 bytes)
[DIR] newfolder (0 bytes)
D:\Uncharted 4\MY_ASSIGNMENT-1 $ cd newfolder
Changed directory to: newfolder
D:\Uncharted 4\MY_ASSIGNMENT-1\newfolder $
```

```
D:\Uncharted 4\MY_ASSIGNMENT-1 $ cp newfile.txt newfile2.txt
cp: No such file or directory
D:\Uncharted 4\MY_ASSIGNMENT-1\newfolder $ cp newfile.txt newfile2.txt
cp: No such file or directory
D:\Uncharted 4\MY_ASSIGNMENT-1\newfolder $ touch newfile.txt
File created/updated: newfile.txt
D:\Uncharted 4\MY_ASSIGNMENT-1\newfolder $ cp newfile.txt newfile2.txt
Copied: newfile.txt -> newfile2.txt
D:\Uncharted 4\MY_ASSIGNMENT-1\newfolder $
```

A screenshot of a code editor interface, likely Visual Studio Code, showing a terminal window with a command-line session. The terminal output shows the creation and modification of files within a project directory named 'MY_ASSIGNMENT-1'. The session starts with creating a new folder, then copying and renaming files, and finally moving a file.

```
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ cp newfile.txt newfile2.txt
cp: No such file or directory
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ cp newfile.txt newfile2.txt
cp: No such file or directory
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ touch newfile.txt
File created/updated: newfile.txt
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ cp newfile.txt newfile2.txt
Copied: newfile.txt -> newfile2.txt
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ mv newfile.txt newfolder/newfile2.txt
mv: No such file or directory
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ cd newfolder
cd: No such file or directory
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ mv newfile.txt newfile2.txt
mv: File exists
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ mv newfile.txt renamed.txt
Moved: newfile.txt -> renamed.txt
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $
```

A second screenshot of the same code editor and terminal session, showing the continuation of the file operations. The terminal output shows the creation of a file 'e.txt', its copy to 'newfile2.txt', its move to 'newfolder/newfile2.txt', and its final rename to 'renamed.txt'.

```
e.txt
File created/updated: newfile.txt
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ cp newfile.txt newfile2.txt
Copied: newfile.txt -> newfile2.txt
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ mv newfile.txt newfolder/newfile2.txt
mv: No such file or directory
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ cd newfolder
cd: No such file or directory
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ mv newfile.txt newfile2.txt
mv: File exists
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ mv newfile.txt renamed.txt
Moved: newfile.txt -> renamed.txt
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $ rm renamed.txt
D:\Uncharted\4\MY_ASSIGNMENT-1\newfolder $
```

The screenshot shows a Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Search Bar:** Q MY_ASSIGNMENT-1
- Explorer:** Shows a folder named "MY_ASSIGNMENT-1" containing "newfolder", "activity_log.txt", "MY_PROJECT.cpp" (selected), and "newfile.txt".
- Terminal:** The title bar says "Welcome" and "MY_PROJECT.cpp 3". The content of the terminal is:

```
298 void showHelp() {
299     cout << "\nAvailable Commands:\n";
300     cout << " ls [path]      - List files and folders\n";
301     cout << " cd <dir>      - Change directory\n";
302     cout << " pwd          - Print current directory\n";
303     cout << " cp <src> <dest> - Copy file\n";
304     cout << " mv <src> <dest> - Move or rename file\n";
305     cout << " rm <path>      - Delete file/folder\n";
306     cout << " touch <file>    - Create empty file\n";
307     cout << " mkdir <dir>     - Create new folder\n";
308     cout << " search <name>   - Search file by name\n";
309     cout << " history        - Show activity log\n";
310     cout << " help           - Show help menu\n";
311     cout << " exit            - Exit explorer\n\n";
312 }
```

Below the code, the terminal shows a help message for the "search" command:

```
D:\Uncharted 4\MY_ASSIGNMENT-1 $ search renamed.txt
D:\Uncharted 4\MY_ASSIGNMENT-1 $ search newfile.txt
.newfile.txt
Type 'help' to see available commands.

Type 'help' to see available commands.
Type 'help' to see available commands.
```

At the bottom of the terminal, there is a list of available commands:

```
D:\Uncharted 4\MY_ASSIGNMENT-1 $ search renamed.txt
D:\Uncharted 4\MY_ASSIGNMENT-1 $ search newfile.txt
.newfile.txt
D:\Uncharted 4\MY_ASSIGNMENT-1 $ cd newfolder
```
- Bottom Status Bar:** Ln 310, Col 53, Spaces: 4, UTF-8, LF, { C++, Go Live, Win32.

The screenshot shows a Visual Studio Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Search Bar:** Q MY_ASSIGNMENT-1
- Explorer:** Shows a folder named "MY_ASSIGNMENT-1" containing "newfolder", "activity_log.txt", "MY_PROJECT.cpp" (selected), and "newfile.txt".
- Terminal:** The title bar says "Welcome" and "MY_PROJECT.cpp 3". The content of the terminal is:

```
298 void showHelp() {
299     cout << "\nAvailable Commands:\n";
300     cout << " ls [path]      - List files and folders\n";
301     cout << " cd <dir>      - Change directory\n";
302     cout << " pwd          - Print current directory\n";
303     cout << " cp <src> <dest> - Copy file\n";
304     cout << " mv <src> <dest> - Move or rename file\n";
305     cout << " rm <path>      - Delete file/folder\n";
306     cout << " touch <file>    - Create empty file\n";
307     cout << " mkdir <dir>     - Create new folder\n";
308     cout << " search <name>   - Search file by name\n";
309     cout << " history        - Show activity log\n";
310     cout << " help           - Show help menu\n";
311     cout << " exit            - Exit explorer\n\n";
312 }
```

Below the code, the terminal shows a help message for the "help" command:

```
\newfile.txt
D:\Uncharted 4\MY_ASSIGNMENT-1 $ help

Available Commands:
ls [path]      - List files and folders
cd <dir>      - Change directory
pwd          - Print current directory
cp <src> <dest> - Copy file
mv <src> <dest> - Move or rename file
rm <path>      - Delete file/folder
touch <file>    - Create empty file
mkdir <dir>     - Create new folder
search <name>   - Search file by name
history        - Show activity log
help           - Show help menu
exit            - Exit explorer
```

At the bottom of the terminal, there is a list of available commands:

```
D:\Uncharted 4\MY_ASSIGNMENT-1 $
```
- Bottom Status Bar:** Ln 204, Col 22, Spaces: 4, UTF-8, LF, { C++, Go Live, Win32.

The screenshot shows a Visual Studio Code interface with the following details:

- File Bar:** File, Edi, Selection, View, Go, Run, Terminal, Help.
- Search Bar:** Search for MY_ASSIGNMENT-1.
- Explorer:** Shows a project structure with files: newfolder, activity_log.txt, MY_PROJECT.cpp (selected), and MY_PROJECT.exe.
- Terminal:** Displays the content of MY_PROJECT.cpp, which contains a void showHelp() function listing various commands like ls, cd, cp, mv, rm, touch, mkdir, search, history, help, and exit.
- Output:** Shows the activity log from the terminal session, including file creation, directory changes, and search operations.
- Terminal Tab:** Shows the command history and the user's exit message: "Goodbye! Have a nice day ;)"
- Status Bar:** In 204, Col 22, Spaces: 4, UTF-8, LF, C++, Go Live, Win32.