

INSTITUTE OF TECHNICAL EDUCATION AND RESEARCH

(SOA Deemed to be University)

PROJECT REPORT ON File Explorer Application (LINUX OS)



Submitted By:

Name: Prince Kumar Singh

Registration No.: 2241019501

Branch: CSE

Batch: 2

CODE:

```
#include <filesystem>
#include <iostream>
#include <fstream>
#include <string>
#include <vector>
#include <sstream>
#include <cstdlib>
#include <cerrno>
#include <cstring>
#include <sys/stat.h>
#include <unistd.h>

namespace fs = std::filesystem;

std::string cwd() {
    std::error_code ec;
    auto p = fs::current_path(ec);
    return ec ? std::string{"<unknown>"} : p.string();
}

std::vector<std::string> split_quoted(const std::string& s) {
    std::vector<std::string> v;
    std::string cur;
    bool in_single = false, in_double = false, esc = false;
    for (char c : s) {
        if (esc) { cur.push_back(c); esc = false; continue; }
        if (c == '\\') { esc = true; continue; }
        if (c == '"' && !in_double) { in_double = !in_double; continue; }
        if (c == "'" && !in_single) { in_single = !in_single; continue; }
        if (std::isspace(static_cast<unsigned char>(c)) && !in_single && !in_double) {
            if (!cur.empty()) { v.push_back(cur); cur.clear(); }
        } else {
            cur.push_back(c);
        }
    }
    if (!cur.empty()) v.push_back(cur);
    return v;
}

bool copy_file_recursive(const fs::path& src, const fs::path& dst) {
    std::error_code ec;
    if (!fs::exists(src, ec)) return false;
    if (fs::is_directory(src, ec)) {
        fs::create_directories(dst, ec);
        if (ec) return false;
        for (fs::recursive_directory_iterator it(src, ec), end; it != end && !ec; ++it) {
```

```

const fs::path rel = fs::relative(it->path(), src, ec);
if (ec) return false;
const fs::path out = dst / rel;
if (it->is_directory(ec)) {
    fs::create_directories(out, ec);
    if (ec) return false;
} else if (it->is_symlink(ec)) {
    std::error_code ec2;
    fs::path target = fs::read_symlink(it->path(), ec2);
    if (ec2) return false;
    fs::create_directories(out.parent_path(), ec2);
    if (ec2) return false;
    fs::remove(out, ec2);
    std::filesystem::create_symlink(target, out, ec2);
    if (ec2) return false;
} else {
    fs::create_directories(out.parent_path(), ec);
    if (ec) return false;
    fs::copy_file(it->path(), out, fs::copy_options::overwrite_existing, ec);
    if (ec) return false;
}
}
return !ec;
} else {
    fs::create_directories(dst.parent_path(), ec);
    if (ec) return false;
    fs::copy_file(src, dst, fs::copy_options::overwrite_existing, ec);
    return !ec;
}
}

```

```

void ls(const fs::path& p) {
    std::error_code ec;
    if (!fs::exists(p, ec)) { std::cerr << "err: no such file or directory\n"; return; }
    if (fs::is_directory(p, ec)) {
        for (auto& e : fs::directory_iterator(p, ec)) {
            std::cout << e.path().filename().string() << "\n";
        }
        if (ec) std::cerr << "err\n";
    } else {
        std::cout << p.filename().string() << "\n";
    }
}

```

```

void search_name(const fs::path& p, const std::string& pat) {
    std::error_code ec;
    if (!fs::exists(p, ec)) { std::cerr << "err\n"; return; }
    for (auto& e : fs::recursive_directory_iterator(p, ec)) {

```

```

    if (e.path().filename().string().find(pat) != std::string::npos) {
        std::cout << fs::relative(e.path(), p, ec).string() << "\n";
    }
    if (ec) { std::cerr << "err\n"; return; }
}
}

```

```

mode_t parse_mode(const std::string& s) {
    if (s.empty() || s.size() > 4) return 0;
    char* end = nullptr;
    long m = std::strtol(s.c_str(), &end, 8);
    if (!end || *end != '\0' || m < 0 || m > 07777) return 0;
    return static_cast<mode_t>(m);
}

```

```

std::string errno_msg() {
    return std::string(std::strerror(errno));
}

```

```

int main() {
    std::ios::sync_with_stdio(false);
    std::cin.tie(nullptr);

    std::string line;
    while (true) {
        std::cout << cwd() << " > " << std::flush;
        if (!std::getline(std::cin, line)) break;
        auto a = split_quoted(line);
        if (a.empty()) continue;
        const std::string& cmd = a[0];

        if (cmd == "exit") {
            break;
        } else if (cmd == "pwd") {
            std::cout << cwd() << "\n";
        } else if (cmd == "ls") {
            fs::path p = a.size() > 1 ? fs::path(a[1]) : fs::path(cwd());
            ls(p);
        } else if (cmd == "cd") {
            fs::path p;
            if (a.size() > 1) p = fs::path(a[1]);
            else {
                const char* h = std::getenv("HOME");
                p = h ? fs::path(h) : fs::path("/");
            }
            std::error_code ec;
            fs::current_path(p, ec);
            if (ec) std::cerr << "err: " << ec.message() << "\n";
        }
    }
}

```

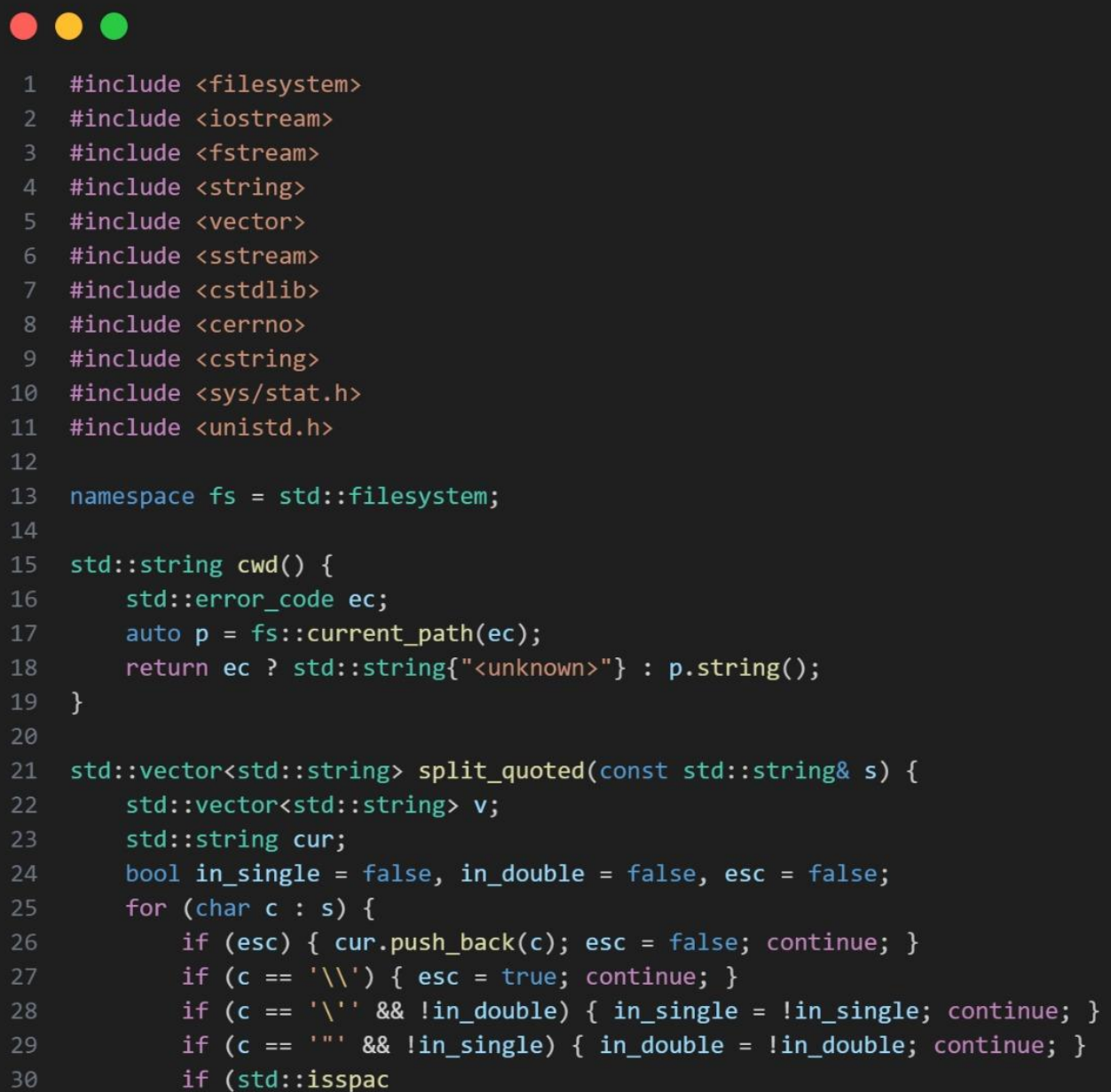
```

} else if (cmd == "cp" && a.size() >= 3) {
    fs::path s = a[1], d = a[2];
    if (!copy_file_recursive(s, d)) std::cerr << "err\n";
} else if (cmd == "mv" && a.size() >= 3) {
    std::error_code ec;
    fs::rename(a[1], a[2], ec);
    if (ec) std::cerr << "err: " << ec.message() << "\n";
} else if (cmd == "rm" && a.size() >= 2) {
    std::error_code ec;
    fs::path p = a[1];
    if (fs::is_directory(p, ec)) fs::remove_all(p, ec);
    else fs::remove(p, ec);
    if (ec) std::cerr << "err: " << ec.message() << "\n";
} else if (cmd == "mkdir" && a.size() >= 2) {
    std::error_code ec;
    fs::create_directories(a[1], ec);
    if (ec) std::cerr << "err: " << ec.message() << "\n";
} else if (cmd == "touch" && a.size() >= 2) {
    std::ofstream f(a[1], std::ios::app);
    if (!f) std::cerr << "err: " << errno_msg() << "\n";
} else if (cmd == "search" && a.size() >= 2) {
    search_name(fs::path(cwd()), a[1]);
} else if (cmd == "chmod" && a.size() >= 3) {
    mode_t m = parse_mode(a[1]);
    if (!m) { std::cerr << "err: bad mode\n"; continue; }
    if (::chmod(a[2].c_str(), m) != 0) std::cerr << "err: " << errno_msg() << "\n";
} else if (cmd == "help") {
    std::cout << "ls [path]\ncd [path]\npwd\n cp <src> <dst>\nmv <src> <dst>\nrm
<path>\nmkdir <path>\ntouch <file>\nsearch <pattern>\nchmod <octal> <path>\nexit\n";
} else {
    std::cerr << "err\n";
}
}
return 0;
}

```

Screenshots

Code:



```
1  #include <filesystem>
2  #include <iostream>
3  #include <fstream>
4  #include <string>
5  #include <vector>
6  #include <sstream>
7  #include <cstdlib>
8  #include <cerrno>
9  #include <cstring>
10 #include <sys/stat.h>
11 #include <unistd.h>
12
13 namespace fs = std::filesystem;
14
15 std::string cwd() {
16     std::error_code ec;
17     auto p = fs::current_path(ec);
18     return ec ? std::string{"<unknown>"} : p.string();
19 }
20
21 std::vector<std::string> split_quoted(const std::string& s) {
22     std::vector<std::string> v;
23     std::string cur;
24     bool in_single = false, in_double = false, esc = false;
25     for (char c : s) {
26         if (esc) { cur.push_back(c); esc = false; continue; }
27         if (c == '\\') { esc = true; continue; }
28         if (c == '\'' && !in_double) { in_single = !in_single; continue; }
29         if (c == '"' && !in_single) { in_double = !in_double; continue; }
30         if (std::isspace
```

```
1         if (std::isspace(static_cast<unsigned char>(c)) && !in_single && !in_double) {
2             if (!cur.empty()) { v.push_back(cur); cur.clear(); }
3         } else {
4             cur.push_back(c);
5         }
6     }
7     if (!cur.empty()) v.push_back(cur);
8     return v;
9 }
10
11 bool copy_file_recursive(const fs::path& src, const fs::path& dst) {
12     std::error_code ec;
13     if (!fs::exists(src, ec)) return false;
14     if (fs::is_directory(src, ec)) {
15         fs::create_directories(dst, ec);
16         if (ec) return false;
17         for (fs::recursive_directory_iterator it(src, ec), end; it != end && !ec; ++it) {
18             const fs::path rel = fs::relative(it->path(), src, ec);
19             if (ec) return false;
20             const fs::path out = dst / rel;
21             if (it->is_directory(ec)) {
22                 fs::create_directories(out, ec);
23                 if (ec) return false;
24             } else if (it->is_symlink(ec)) {
25                 std::error_code ec2;
26                 fs::path target = fs::read_symlink(it->path(), ec2);
27                 if (ec2) return false;
28                 fs::create_directories(out.parent_path(), ec2);
29                 if (ec2) return false;
30                 fs::remove(out, ec2);
31                 std::filesystem::create_symlink(target, out, ec2);
32                 if (ec2) return false;
33             }
```

```

1         if (ec2) return false;
2     } else {
3         fs::create_directories(out.parent_path(), ec);
4         if (ec) return false;
5         fs::copy_file(it->path(), out, fs::copy_options::overwrite_existing, ec);
6         if (ec) return false;
7     }
8 }
9 return !ec;
10 } else {
11     fs::create_directories(dst.parent_path(), ec);
12     if (ec) return false;
13     fs::copy_file(src, dst, fs::copy_options::overwrite_existing, ec);
14     return !ec;
15 }
16 }
17
18 void ls(const fs::path& p) {
19     std::error_code ec;
20     if (!fs::exists(p, ec)) { std::cerr << "err: no such file or directory\n"; return; }
21     if (fs::is_directory(p, ec)) {
22         for (auto& e : fs::directory_iterator(p, ec)) {
23             std::cout << e.path().filename().string() << "\n";
24         }
25         if (ec) std::cerr << "err\n";
26     } else {
27         std::cout << p.filename().string() << "\n";
28     }
29 }
30
31 void search_name(const fs::path& p, const std::string& pat) {
32     std::error_code ec;
33     if (!fs::exists(p, ec)) { std::cerr << "err\n"; return; }
34     for (auto& e : fs::recursive_directory_iterator(p, ec)) {
35         if (e.path().filename().string().find(pat) != std::string::npos) {
36             std::cout << fs::relative(e.path(), p, ec).string() << "\n";
37         }
38         if (ec) { std::cerr << "err\n"; return; }
39     }
40 }
41
42 mode_t parse_mode(const std::string& s) {
43     if (s.empty() || s.size() > 4) return 0;
44     char* end = nullptr;
45     long m = std::strtol(s.c_str(), &end, 8);
46     if (!end || *end != '\0' || m < 0 || m > 07777) return 0;
47     return static_cast<mode_t>(m);
48 }
49

```



```
1
2  std::string errno_msg() {
3      return std::string(std::strerror(errno));
4  }
5
6  int main() {
7      std::ios::sync_with_stdio(false);
8      std::cin.tie(nullptr);
9
10     std::string line;
11     while (true) {
12         std::cout << cwd() << " > " << std::flush;
13         if (!std::getline(std::cin, line)) break;
14         auto a = split_quoted(line);
15         if (a.empty()) continue;
16         const std::string& cmd = a[0];
17
18         if (cmd == "exit") {
19             break;
20         } else if (cmd == "pwd") {
21             std::cout << cwd() << "\n";
22         } else if (cmd == "ls") {
23             fs::path p = a.size() > 1 ? fs::path(a[1]) : fs::path(cwd());
24             ls(p);
25         } else if (cmd == "cd") {
26             fs::path p;
27             if (a.size() > 1) p = fs::path(a[1]);
28             else {
29                 const char* h = std::getenv("HOME");
30                 p = h ? fs::path(h) : fs::path("/");
31             }
32             std::error_code ec;
33             fs::current_path(p, ec);
34             if (ec) std::cerr << "err: " << ec.message() << "\n";
35         } else if (cmd == "cp" && a.size() >= 3) {
36             fs::path s = a[1], d = a[2];
37
```

```

1   if (!copy_file_recursive(s, d)) std::cerr << "err\n";
2   } else if (cmd == "mv" && a.size() >= 3) {
3       std::error_code ec;
4       fs::rename(a[1], a[2], ec);
5       if (ec) std::cerr << "err: " << ec.message() << "\n";
6   } else if (cmd == "rm" && a.size() >= 2) {
7       std::error_code ec;
8       fs::path p = a[1];
9       if (fs::is_directory(p, ec)) fs::remove_all(p, ec);
10      else fs::remove(p, ec);
11      if (ec) std::cerr << "err: " << ec.message() << "\n";
12  } else if (cmd == "mkdir" && a.size() >= 2) {
13      std::error_code ec;
14      fs::create_directories(a[1], ec);
15      if (ec) std::cerr << "err: " << ec.message() << "\n";
16  } else if (cmd == "touch" && a.size() >= 2) {
17      std::ofstream f(a[1], std::ios::app);
18      if (!f) std::cerr << "err: " << errno_msg() << "\n";
19  } else if (cmd == "search" && a.size() >= 2) {
20      search_name(fs::path(cwd()), a[1]);
21  } else if (cmd == "chmod" && a.size() >= 3) {
22      mode_t m = parse_mode(a[1]);
23      if (!m) { std::cerr << "err: bad mode\n"; continue; }
24      if (::chmod(a[2].c_str(), m) != 0) std::cerr << "err: " << errno_msg() << "\n";
25  } else if (cmd == "help") {
26      std::cout << "ls [path]\ncd [path]\npwd\ncp <src> <dst>\nmv <src> <dst>\nrm <path>\nmkdir <path>\ntouch <file>\nsearch <pattern>\nchmod <octal> <path>\nexits\n";
27  } else {
28      std::cerr << "err\n";
29  }
30 }
31 return 0;
32
33

```

Output :

```

princesng03@AsusVivobooks
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Prince kumar singh> ubuntu
princesng03@AsusVivobooks14Flip:~$ ls
prince1 wipro
princesng03@AsusVivobooks14Flip:~$ cd wipro
princesng03@AsusVivobooks14Flip:~/wipro$ ls
Assignment1 Assignment1.cpp Assignment1.cpp:Zone.Identifier
princesng03@AsusVivobooks14Flip:~/wipro$ ./Assignment1
/home/princesng03/wipro > ls
Assignment1
Assignment1.cpp:Zone.Identifier
Assignment1.cpp
/home/princesng03/wipro > cd ..
/home/princesng03 > ls
.bashrc
.bash_history
.cache
.motd_shown
.bash_logout
.sudo_as_admin_successful
.profile
.landscape
prince1
wipro
/home/princesng03 > cd prince1
/home/princesng03/prince1 > mkdir project1
/home/princesng03/prince1 > ls
dos
project1
/home/princesng03/prince1 >

```