

21BDS0340

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Operating Systems Lab

## Assignment – II

### Question 1

Aim:

To simulate the 'ls' command

Program:

```
#include <iostream>
#include <filesystem>

namespace fs = std::filesystem;

void listDirectoryContents(const std::string &path)
{
    // listing contents of directory
    for (const auto &entry : fs::directory_iterator(path))
        std::cout << entry.path().filename().string() << std::endl;
}

int main(int argc, char *argv[])
{
    std::string path;

    // if number of arguments > 1, then path is given
    if (argc > 1)
        path = argv[1];
    // else assigne path to current directory
    else
        path = fs::current_path().string();

    listDirectoryContents(path);
}
```

Output:

```
((base) abhi@Abhinavs-MBP Assignment 2 % clang++ -std=c++17 -stdlib=libc++ ls.cpp -o ls
((base) abhi@Abhinavs-MBP Assignment 2 % ./ls ../../
Computer Networks
.DS_Store
Database Management Systems Lab
Operating Systems Lab
Extra Curricular
Operating Systems
Computer Networks Lab
Compiler Design Lab
Compiler Design
STS
Information Security and Audit Lab
```

## Question 2

### Aim:

To demonstrate system calls for files

### Program:

```
#include <iostream>
#include <fstream>

int main()
{
    // opening output file
    std::ofstream outputFile("output.txt");
    if (!outputFile)
    {
        std::cerr << "Failed to open the file for writing." << std::endl;
        return 1;
    }

    // writing data to file
    outputFile << "Hi my name is Abhinav Dinesh Srivatsa." << std::endl;
    outputFile << "My registration number is 21BDS0340." << std::endl;
    outputFile.close();

    // opening input file
    std::ifstream inputFile("output.txt");
    if (!inputFile)
    {
        std::cerr << "Failed to open the file for reading." << std::endl;
        return 1;
    }

    // reading data from file
    std::string line;
    while (std::getline(inputFile, line))
    {
        std::cout << line << std::endl;
    }
    inputFile.close();
}
```

### Output:

```
((base) abhi@Abhinavs-MBP Assignment 2 % clang++ -std=c++17 -stdlib=libc++ syscalls.cpp -o syscalls
((base) abhi@Abhinavs-MBP Assignment 2 % ./syscalls
Hi my name is Abhinav Dinesh Srivatsa.
My registration number is 21BDS0340.
```

 output.txt

```
1 Hi my name is Abhinav Dinesh Srivatsa.
2 My registration number is 21BDS0340.
3
```

### Question 3

#### Aim:

To simulate the 'cd' command

#### Program:

```
#include <iostream>
#include <unistd.h>

int main(int argc, char *argv[])
{
    // checking if 2 arguments present
    if (argc != 2)
    {
        std::cerr << "Usage: " << argv[0] << " <directory>" << std::endl;
        return 1;
    }

    // sending error if change directory invalid
    if (chdir(argv[1]) != 0)
    {
        std::cerr << "Failed to change directory." << std::endl;
        return 1;
    }

    // displaying current directory if valid
    char *cwd = getcwd(nullptr, 0);
    if (cwd != nullptr)
    {
        std::cout << "Current directory: " << cwd << std::endl;
        free(cwd);
    }
    else
    {
        std::cerr << "Failed to get current directory." << std::endl;
        return 1;
    }
}
```

#### Output:

```
[(base) abhi@Abhinavs-MBP Assignment 2 % clang++ -std=c++17 -stdlib=libc++ cd.cpp -o cd
[(base) abhi@Abhinavs-MBP Assignment 2 % ./cd
Usage: ./cd <directory>
[(base) abhi@Abhinavs-MBP Assignment 2 % ./cd ..
Current directory: /Users/abhi/College Work/Year 3 Semester 1 (Sem 5)/Operating Systems Lab
```

## Question 4

### Aim:

To simulate the 'mv' command

### Program:

```
#include <iostream>
#include <stdio>

int main(int argc, char *argv[])
{
    // checking if 3 arguments provided
    if (argc != 3)
    {
        std::cerr << "Usage: " << argv[0] << " <source> <destination>" <<
std::endl;
        return 1;
    }

    const char *source = argv[1];
    const char *destination = argv[2];

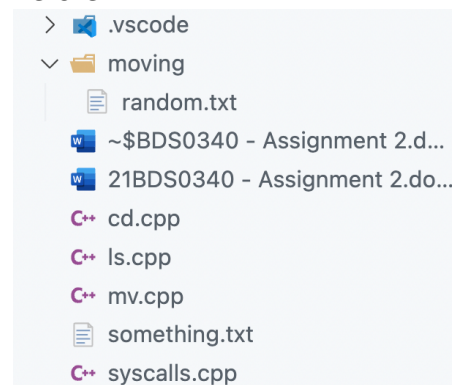
    // if renaming file did not work, throw error
    if (rename(source, destination) != 0)
    {
        std::cerr << "Failed to move the file." << std::endl;
        return 1;
    }

    // display success message
    std::cout << "File moved successfully." << std::endl;
}
```

### Output:

```
[(base) abhi@Abhinavs-MBP Assignment 2 % clang++ -std=c++17 -stdlib=libc++ mv.cpp -o mv
[(base) abhi@Abhinavs-MBP Assignment 2 % ./mv something.txt moving/something.txt
File moved successfully.
```

### Before:



### After:

