Lab 0
Concurrent Programming

Name : Suraj B Thite

Code Organization :

The below tree describes the brief organization of the code developed for the Lab0.

Lab0

|----main.c - Main Application File consisting sequential flow of operations.

- ➢ main()
- ➢ file_to_array()
- ➢ array_to_file()

|----sorts.c - Source File consisting of functions for Merge sort and Quick sort on input data.

- ➢ mergesort()
- ➢ quicksort()
- ➢ partition()
- ➢ swap()
- ➢ merge ()

|----Makefile - Make file to build the project and application binary mysort.

|----Readme.md - A readme file for the usage of binary.

Files Description:

1. **main.c :** The main application source file which consist of sequential flow of instruction to parse input from the user, fetch the data from the file, sort the data depending upon the argument passed and writeback to the output file. In case of –name argument is passed, the Author name i.e. Suraj Thite is printed and the rest of the process is skipped. The getopt_long() function is used to parse the arguments from the user.
2. **sorts.c :** The source application for merge and quick sort algorithms along with associated member functions. The function takes the array as input arguments and sorts it.
3. **Makefile :** The make file to build the source binaries using gnu C compiler running on Linux Platform.
4. **Readme.md :**The markdown file for application usage.

Compilation Instructions :

Navigate to the working directory of the project and open a terminal.

Run make to compile the project and generate mysort binary file.

Run make clean to clean the application binary from the project folder.

Execution Instructions :

Usage :

./mysort [--name] [sourcefile.txt] [-o outputfile.txt] [--alg=<merge,quick>] as per lab0 requirements.

If -- name is passed as argument, the program is terminated.

Failure to open the input file or write sorted data to the output file or incorrect no of arguments passed will stop the further execution printing appropriate messages on terminal.

Extant Bugs :

No bugs in the code as such, the project compiles successfully and passes the test case as mentioned in the assignment requirements.

```
suraj@suraj-virtual-machine:~/Desktop/Lab0$ ./mysort --name
Name = Suraj Thitesuraj@suraj-virtual-machine:~/Desktop/Lab0$
suraj@suraj-virtual-machine:~/Desktop/Lab0$ printf "3\n2\n1\n" > 321.txt
suraj@suraj-virtual-machine:~/Desktop/Lab0$ cat 321.txt
3
2
1
suraj@suraj-virtual-machine:~/Desktop/Lab0$ ./mysort 321.txt -o out.txt --alg=quick
Valid Text File Found!
handler_t.f_size = 3
Scanning Output file is passed
Output file Valid!
************** The Input array is *****************
3
2
1

Executing Quick Sort
Writing Data to the file
************** The Sorted array is *****************
1
2
3
suraj@suraj-virtual-machine:~/Desktop/Lab0$ cat out.txt
1
2
3
```

```
suraj@suraj-virtual-machine:~/Desktop/Lab0$ cmp --silent your1.txt soln1.txt && echo "Pass (5 pts )" || echo "Fail (0 pts )"
Pass (5 pts )
suraj@suraj-virtual-machine:~/Desktop/Lab0$
```

The test cases as mentioned in the lab0 assignment document passes successfully as per the above images.