

Lesson7.1

Task2. Subtask 1: Writing `main.cpp`

```
KaguOS > C++ main.cpp > ...
1  #include <iostream>
2  #include <fstream>
3  #include <thread>
4  #include <chrono>
5  using namespace std;
6
7  int main() {
8      ofstream outfile("test.txt");
9      if (!outfile.is_open()) {
10         cerr << "Error opening file!" << endl;
11         return 1;
12     }
13     for (int i = 1; i <= 1000; ++i) {
14         outfile << "Iteration " << i << endl;
15         outfile.flush();
16
17         this_thread::sleep_for(chrono::seconds(1));
18     }
19     outfile.close();
20     return 0;
21 }
22
```

```
Iteration 151
Iteration 152
Iteration 153
Iteration 154
Iteration 155
Iteration 156
Iteration 157
Iteration 158
Iteration 159
Iteration 160
Iteration 161
Iteration 162
Iteration 163
Iteration 164
```

```

#ls@kali:~$ kagoo5 ps -aux | grep main
root      1160  0.0  0.0 10584  512 ?        S    07:30  0:00 /snap/multipass/14300/usr/shin/dnsmasq --keep-in-foreground --strict-order --bind-interfaces --pid-file=/var/snap/multipass/common/data/multipass/network/dnsmasq leases --dhcp-hosts-file=/var/snap/multipass/common/data/multipass/network/dnsmasq/hosts --dnsmasg-10.114.134.2,10.114.134.254,Infinite --conf-file=/var/snap/multipass/common/data/multipass/network/dnsmasq-vh270.conf
root      1425  0.6  5.7 1737268 55736 ?        Sl   07:31  0:19 /home/ubuntu/vscode-server/c1/servers/Stable-609a9c3d664eade5cf376d1c76f13985724bcu/server/node /no
root      1427  0.0  0.0 10584  512 ?        S    07:31  0:00 /snap/multipass/14300/usr/shin/dnsmasq --keep-in-foreground --strict-order --bind-interfaces --pid-file=/var/snap/multipass/common/data/multipass/network/dnsmasq leases --dhcp-hosts-file=/var/snap/multipass/common/data/multipass/network/dnsmasq-vh270.conf
root      1947  0.0  0.2  7876  2176 pts/2    S+   08:22  0:00 grep --color -e main
#ls@kali:~$ kagoo5 ps -aux | grep main

```

[illegible]

Task2. Subtask 2: Writing `files.cpp`

```

1 #include <iostream>
2 #include <fstream>
3 #include <vector>
4 #include <string>
5 #include <thread>
6 #include <chrono>
7 using namespace std;
8
9 int main() {
10     vector<ofstream> files;
11     for (int i = 0; i < 10; ++i) {
12         string filename = "file_" + to_string(i) + ".txt";
13         files.push_back(ofstream(filename));
14         if (files.empty()) {
15             cerr << "Error opening file: " << filename << endl;
16             return 1;
17         }
18     }
19
20     for (int i = 0; i < 10; ++i) {
21         files[i] << "This is file number " << i << endl;
22         files[i].flush();
23     }
24
25     this_thread::sleep_for(chrono::seconds(100));
26     return 0;
27 }

```

```

ubuntu@noble2:~$ ps -aux | grep files
ubuntu  5779  0.0  0.3  6504 3584 pts/1    S+   09:01   0:00 ./files
ubuntu  5889  0.0  0.2  7076 2176 pts/3    S+   09:01   0:00 grep --color=auto files
ubuntu@noble2:~$ ls -l /proc/5779/fd
total 0
lrwx----- 1 ubuntu ubuntu 64 Mar 10 09:01 0 -> /dev/pts/1
lrwx----- 1 ubuntu ubuntu 64 Mar 10 09:01 1 -> /dev/pts/1
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 10 -> /home/ubuntu/KaguOS/file_7.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 11 -> /home/ubuntu/KaguOS/file_8.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 12 -> /home/ubuntu/KaguOS/file_9.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 19 -> /home/ubuntu/.vscode-server/data/logs/202
503107073130/remoteTelemetry.log
lrwx----- 1 ubuntu ubuntu 64 Mar 10 09:01 2 -> /dev/pts/1
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 20 -> /home/ubuntu/.vscode-server/data/logs/202
503107073130/ptyhost.log
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 22 -> /home/ubuntu/.vscode-server/data/logs/202
503107073130/remnoteagent.log
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 3 -> /home/ubuntu/KaguOS/file_0.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 4 -> /home/ubuntu/KaguOS/file_1.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 5 -> /home/ubuntu/KaguOS/file_2.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 6 -> /home/ubuntu/KaguOS/file_3.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 7 -> /home/ubuntu/KaguOS/file_4.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 8 -> /home/ubuntu/KaguOS/file_5.txt
l-wx----- 1 ubuntu ubuntu 64 Mar 10 09:01 9 -> /home/ubuntu/KaguOS/file_6.txt
ubuntu@noble2:~$

```

Task2. Subtask 3: Writing file_limit.cpp

```

ubuntu@noble2:~$ cat /proc/sys/fs/file-max
9223372036854775807
ubuntu@noble2:~$ sudo bash -c 'echo 65535 > /proc/sys/fs/file-max'
ubuntu@noble2:~$ cat /proc/sys/fs/file-max
65535
ubuntu@noble2:~$

```

```

#include <iostream>
#include <fstream>
#include <vector>
#include <string>
#include <thread>
#include <chrono>
using namespace std;

int main() {
    vector<ofstream> files;
    int filesToOpen = 100000;
    for (int i = 0; i < filesToOpen; ++i) {
        string filename = "file_" + to_string(i) + ".txt";
        files.push_back(ofstream(filename));

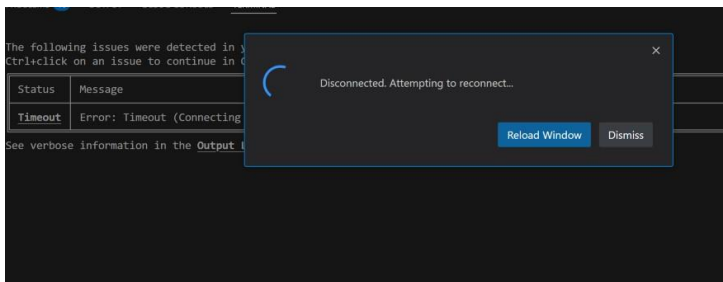
        if (!files.back()) {
            cerr << "Error opening file: " << filename << endl;
            return 1;
        }

        if (i % 1000 == 0) {
            this_thread::sleep_for(chrono::seconds(1));
        }
    }

    this_thread::sleep_for(chrono::seconds(100));

    return 0;
}

```



Observe system behavior when limits are exceeded: As a result, the SSH connection dropped

Task3: Bootloader for KaguOS

```
ubuntu@noble2:~/KaguOS$ ./bootloader build/kernel.disk 1500
DEBUG OFF
Test 5 - 3 = 2:
OK
Test 10 - 5 = 5:
OK
Test 0 - 0 = 0:
OK
Test 0 - 5 = -5:
OK
Test 6.5 - 2.4 = 4.1:
OK
Test -2 - -2 = 0:
OK
Test -3 - 3 = -6:
OK
Test 10.5 - 7.3 = 3.2:
OK
Test -1.1 - 0.9 = -1.9:
OK
Test 2.999 - 2.0 = 0.999:
OK
Total tests: 10
Successful tests: 10
CPU Halted
ubuntu@noble2:~/KaguOS$
```

```
KaguOS > C= check_file.cpp > main()
16 int main() {
17     cin >> file1;
18
19     ifstream f1(file1), f2(file2);
20
21     if (!f1.is_open()) {
22         cerr << "Error: Cannot open file " << file1 << endl;
23         return 1;
24     }
25     if (!f2.is_open()) {
26         cerr << "Error: Cannot open file " << file2 << endl;
27         return 1;
28     }
29
30     string line1, line2;
31     int lineNum = 1;
32     bool filesAreDifferent = false;
33
34     while (getline(f1, line1) && getline(f2, line2)) {
35         if (line1 != line2) {
36             cout << "Files differ at line " << lineNum << "\n";
37             cout << line1 << " " << line2 << "\n";
38             cout << file1 << " " << file2 << "\n";
39             filesAreDifferent = true;
40             break;
41         }
42         lineNum++;
43     }
44 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
ubuntu@noble2:~/KaguOS$ ./check_file
Enter the first filename: first.txt
Enter the second filename: second.txt
Files are identical
ubuntu@noble2:~/KaguOS$ ./check_file
Enter the first filename: first.txt
Enter the second filename: second.txt
Files differ at line 7:
first.txt: Functions nested, Outputs compiled.
second.txt: Functions nested, outputs compiled
ubuntu@noble2:~/KaguOS$ ./check_file
Enter the first filename: first.txt
Enter the second filename: second.txt
Files differ in length at line 15
ubuntu@noble2:~/KaguOS$
```