ITF22519: Introduction to Operating Systems

Lab 7: Thread Programming 2

Exercise 1.

```
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$ clang -pthread Exercise1.c -o Exercise1
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$ ./Exercise1
Count is -55026587
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$ ./Exercise1
Count is -41902483
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$ ./Exercise1
Count is -27936425
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$ ./Exercise1
Count is 47129976
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$ ./Exercise1
Count is -36411012
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$ ./Exercise1
Count is -23693568
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$
```

The program works by creating two threads which run the Increase and Decrease functions respectively. They run simultaneously and both threads alter the global variable “count” concurrently. This results in a race condition on the variable “count” and the end result is unpredictable.

Exercise 2.

I have verified the output of my Exercise2 program with my script “Ex2_test.sh”. This test script compares the output of each program run and compares it with the desired output.

```
test_cases=100;
passed_cases=0;
failed_cases=0;

for ((i = 1; i <= test_cases; i++)); do
        ./Exercise2 > Ex2_output.txt
        if cmp -s "Ex2_control.txt" "Ex2_output.txt"; then
                ((passed_cases++))
        else
                ((failed_cases++))
        fi
done

printf "%d cases were tested\n" "$test_cases"
printf "Tests passed: %d\n" "$passed_cases"
printf "Tests failed: %d\n" "$failed_cases"
```

```
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$ bash Ex2_test.sh
100 cases were tested
Tests passed: 100
Tests failed: 0
jrlundqv@IdeaPad5:~/OneDrive/22høst/OS/labs/lab7$
```