

## **Programming Problems : 3.22**

**Purpose :** Implement The Collatz conjecture using shared memory

**Input :** a number  $n$

**Output :** a sequence that converge to 1

**OS :** Linux

### **Capabilities :**

allow the child to write the contents of the sequence to the shared-memory object.

The parent then output the sequence when the child completes

The parent process will progress through the following steps:

- a. Establish the shared-memory object (`shm open()`, `ftruncate()`, and `mmap()`).
- b. Create the child process and wait for it to terminate.
- c. Output the contents of shared memory.
- d. Remove the shared-memory object.

```
os@debian: ~/Desktop
File Edit View Terminal Help
os@debian:~/Desktop$ gcc 3.22.c -lrt -o output
os@debian:~/Desktop$ ./output
n : 35
35, 106, 53, 160, 80, 40, 20, 10, 5, 16, 8, 4, 2, 1
Child Complete
os@debian:~/Desktop$ ./output
n : 8
8, 4, 2, 1
Child Complete
os@debian:~/Desktop$ ./output
n : 167
167, 502, 251, 754, 377, 1132, 566, 283, 850, 425, 1276, 638, 319, 958, 479, 143
8, 719, 2158, 1079, 3238, 1619, 4858, 2429, 7288, 3644, 1822, 911, 2734, 1367, 4
102, 2051, 6154, 3077, 9232, 4616, 2308, 1154, 577, 1732, 866, 433, 1300, 650, 3
25, 976, 488, 244, 122, 61, 184, 92, 46, 23, 70, 35, 106, 53, 160, 80, 40, 20, 1
0, 5, 16, 8, 4, 2, 1
Child Complete
os@debian:~/Desktop$
```

by Mina Shaigan