

5. Assignment

Process Communication, Signals

Issue: May 25—Due: June 2

Exercise 7: *Alarm, Alarm, Alarm*

10 Points

The POSIX function `alarm(2)` has the disadvantage that only a single active countdown can be set for a process. If `alarm(2)` is already set and a further call to `alarm(2)` issues a new countdown the former wake-up call will never happen.

Implement a routine `timer`, which behaves just as `alarm(2)`, with the additional functionality of providing an arbitrary amount of timers for concurrent usage. I.e.:

- a function call `timer(t)` starts a countdown with t seconds,
- the process which has invoked the timer will receive a `SIGALRM` signal after the countdown.
- A sequence `timer(t1), ..., timer(tn)` informs the process t_i seconds after the i th call of `timer`, for **all** i in $[1..n]$.

Additional remark: It is safe to assume that the `SIGUSR1` signal is not in use for any other purpose. You may use it to implement your solution if you want to.