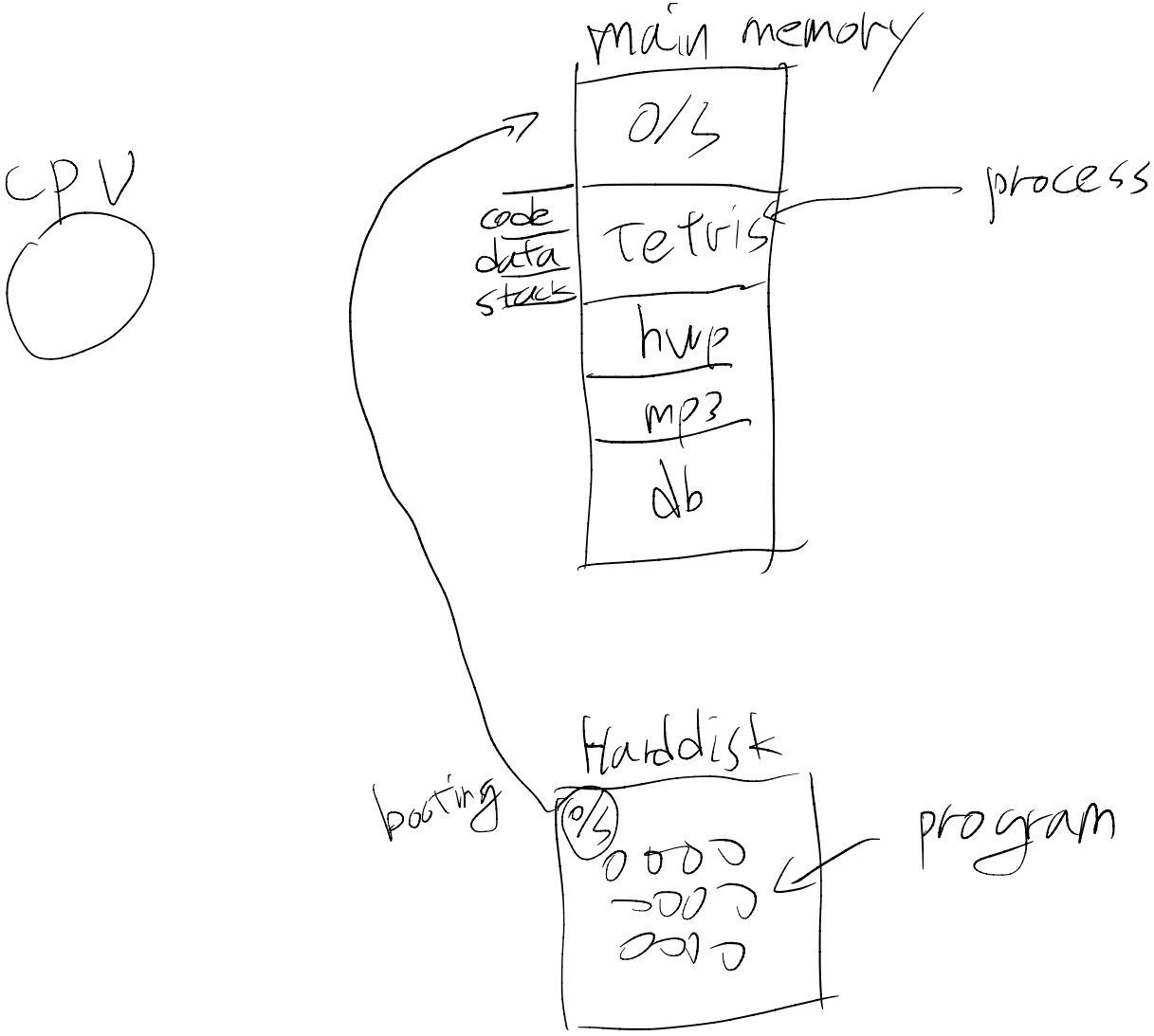

main memory
O/S
code
data
stack
Tetris
process
hwp
mp3
db
CPU
Harddisk
booting
O/S
program

When program is

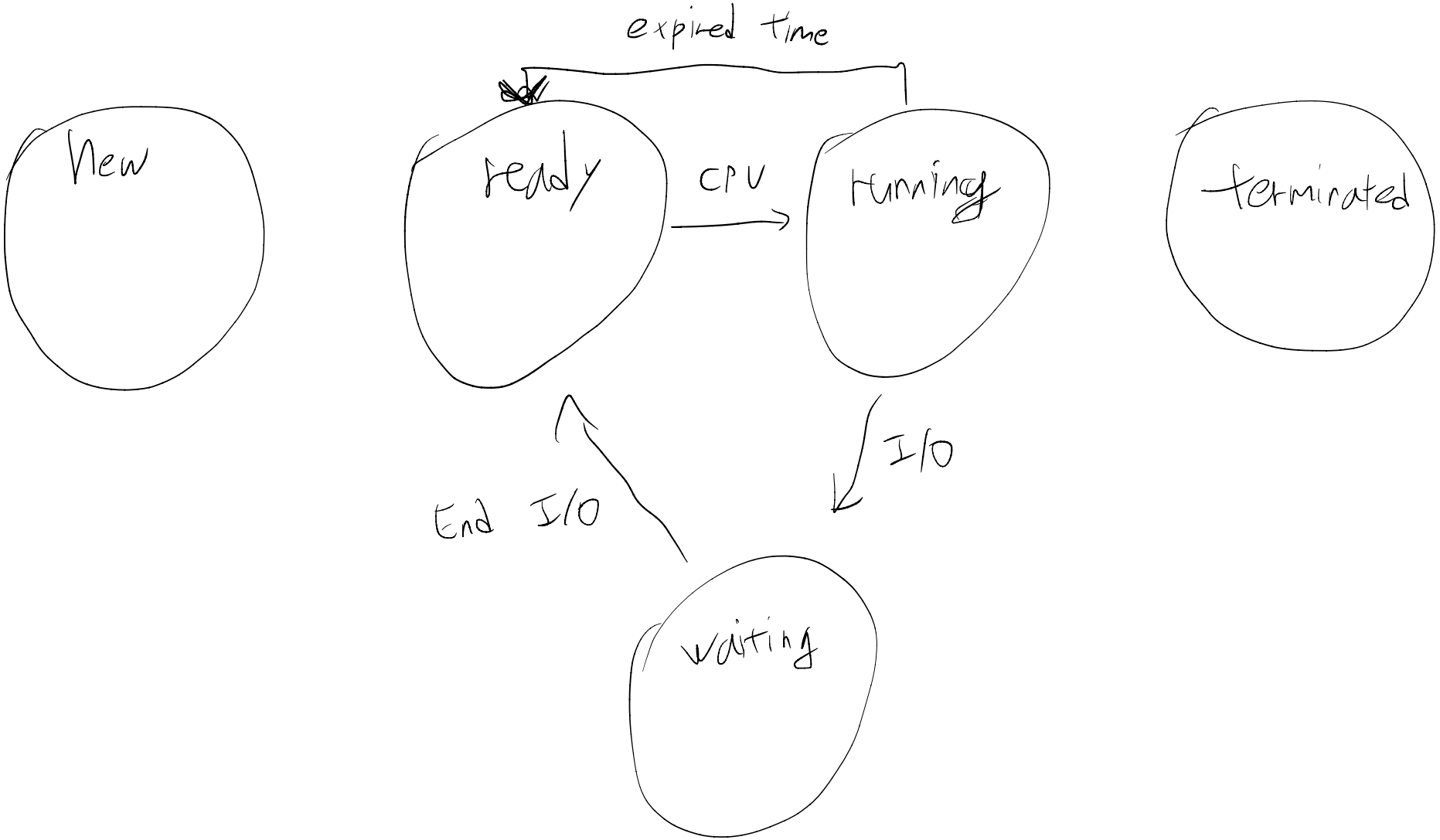
in the main memory

From hard disk

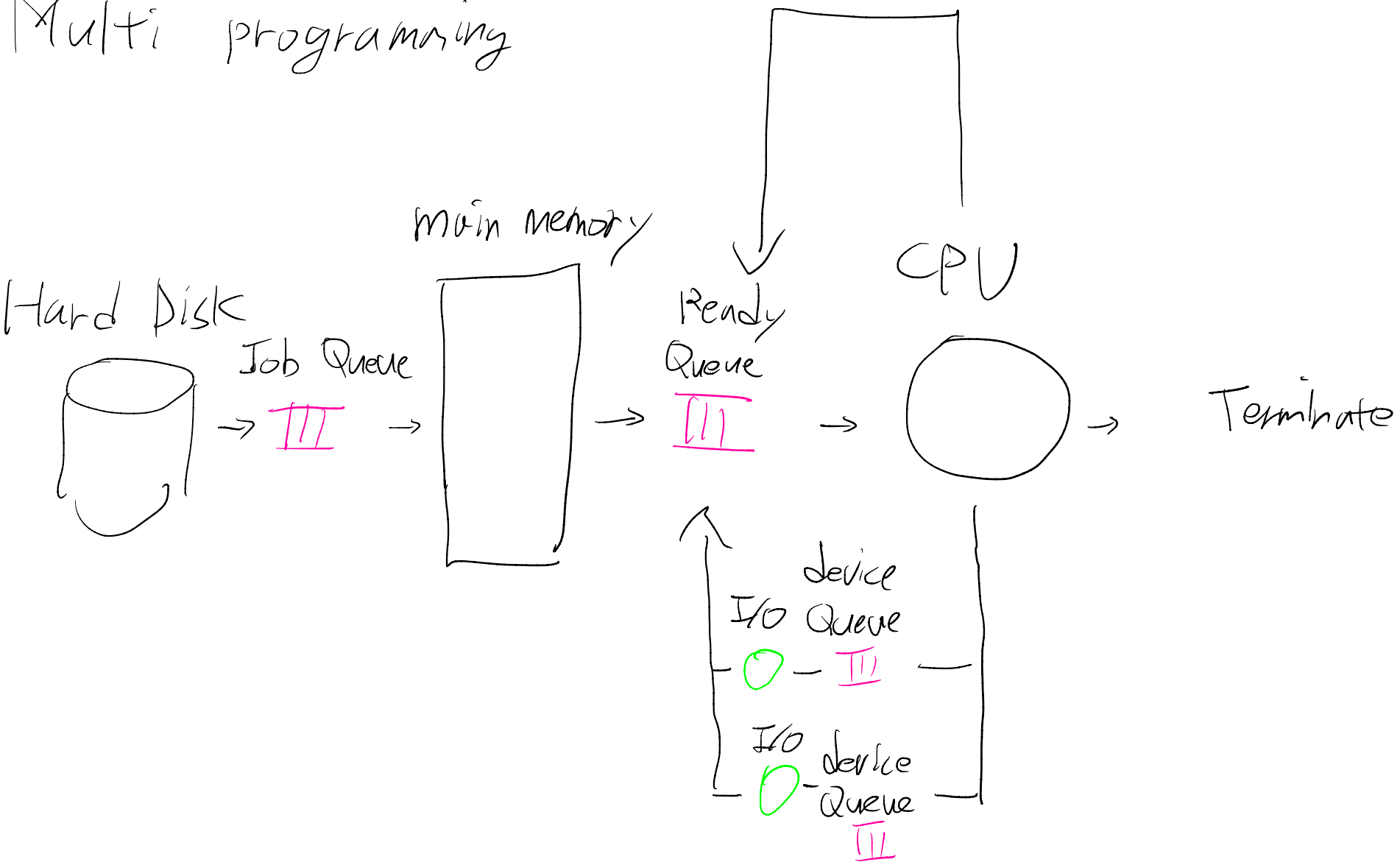
Process in main memory

completes all initialization

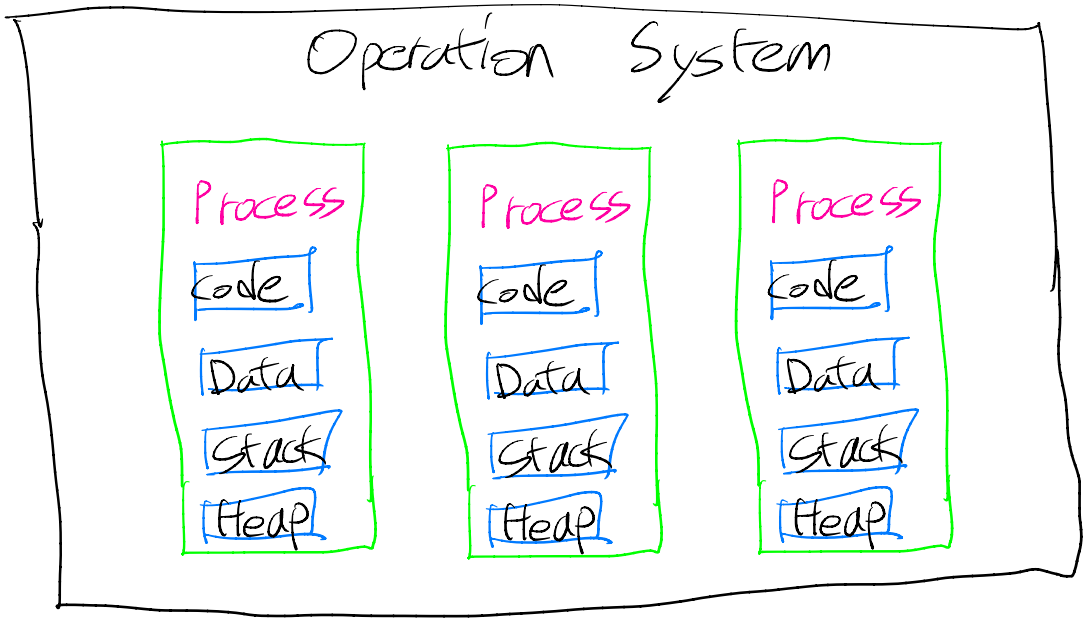
and wait for execution running by CPU



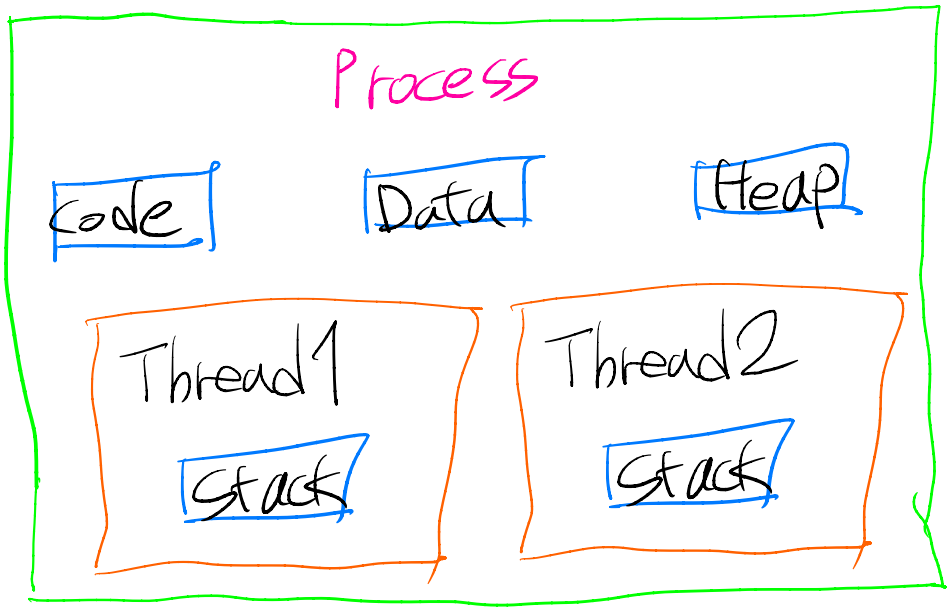
Multi programming

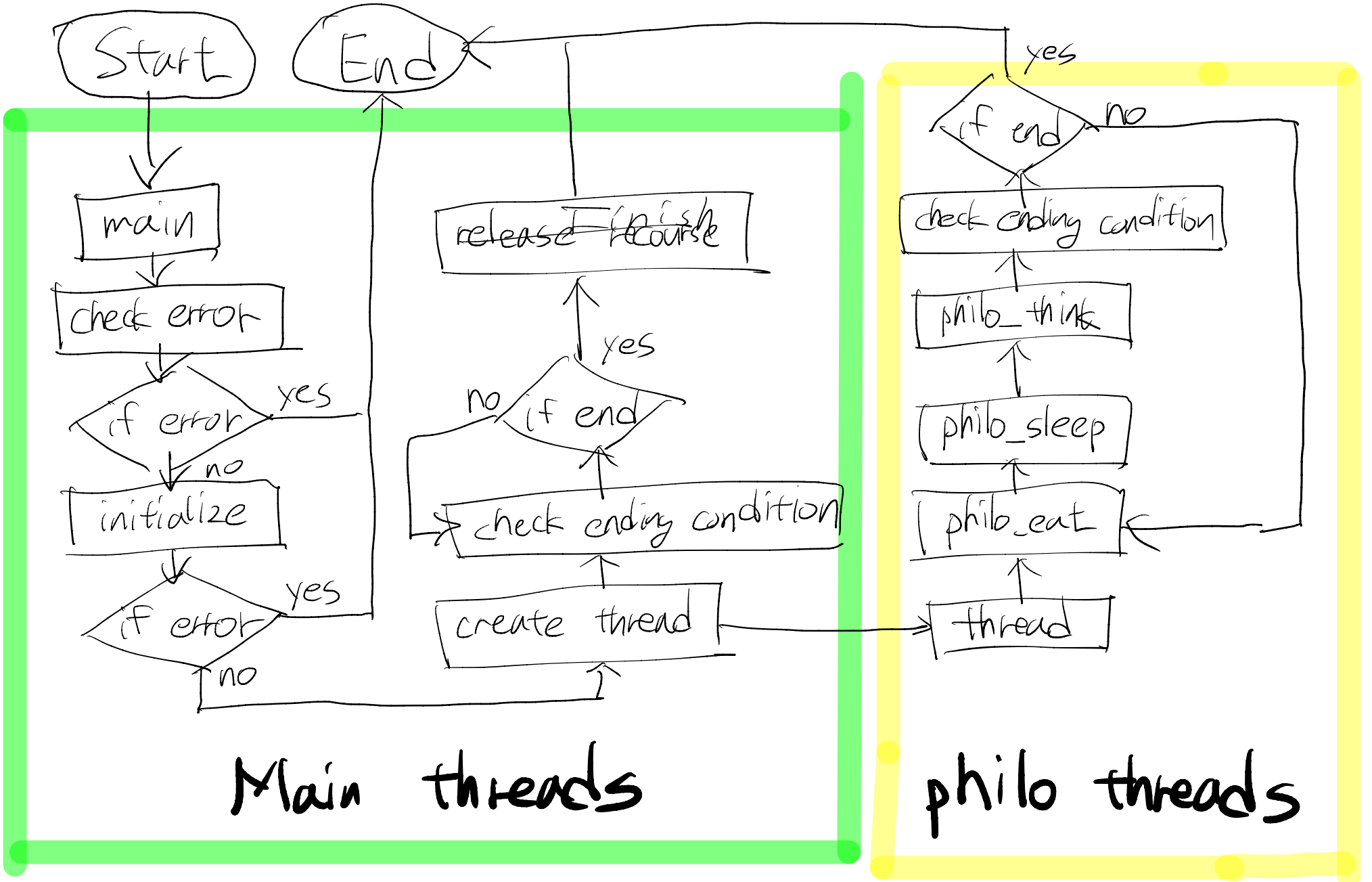


A) Process

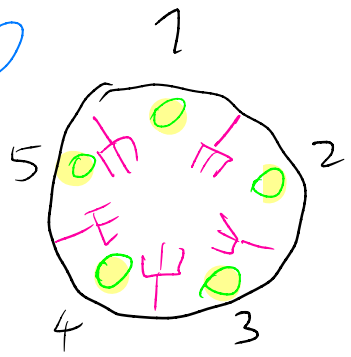


B) Thread

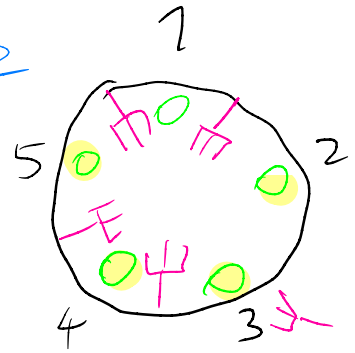



Start
End
main
check error
if error
yes
no
initialize
if error
yes
no
release ~~Finish~~ resource
yes
no
if end
check ending condition
create thread
yes
if end
no
check ending condition
philo_think
philo_sleep
philo_eat
thread
Main threads
philo threads

0

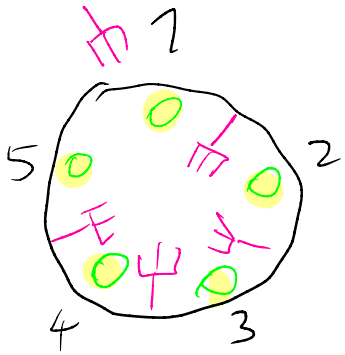


2



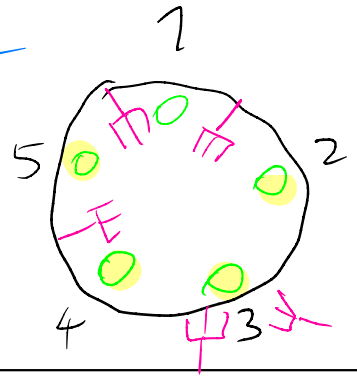
3 has taken a right fork

0



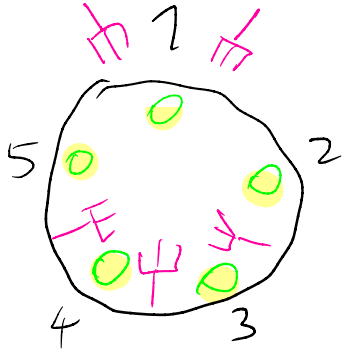
1 has taken a right fork

2



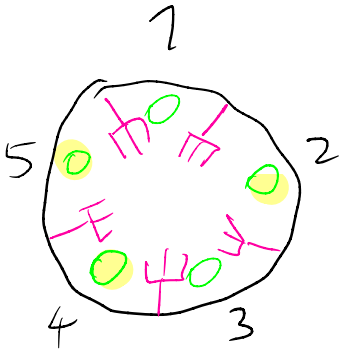
3 has taken a left fork

0



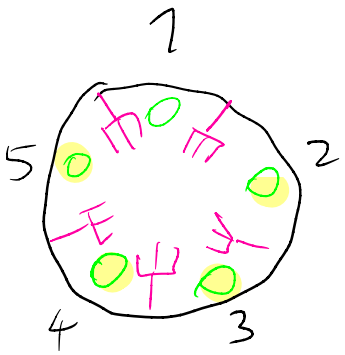
1 has taken a left fork

2



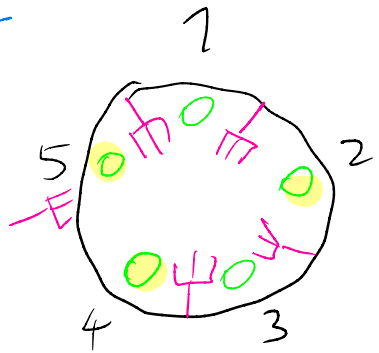
3 is eating drop ~~forks~~

0



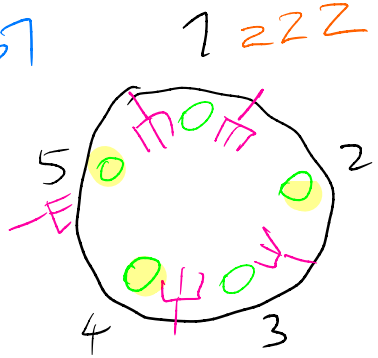
1 is eating drop ~~forks~~

4



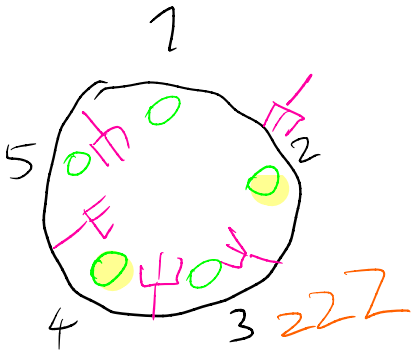
5 has taken a right fork

207



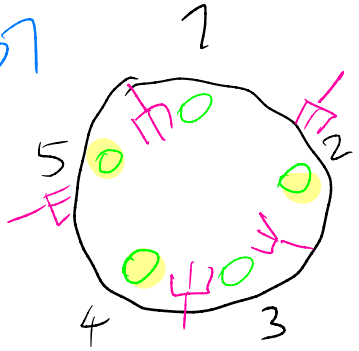
1 is sleeping

202



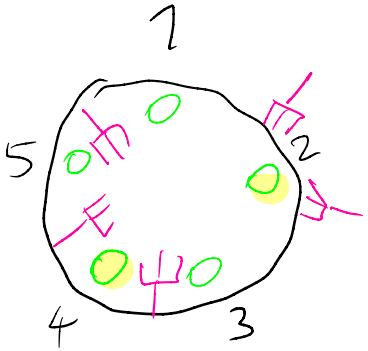
3 is sleeping

207



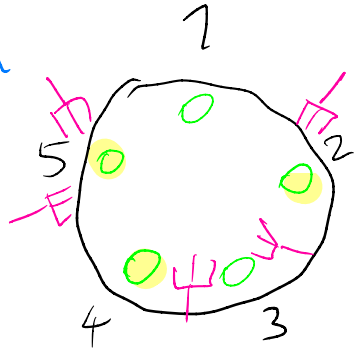
2 has taken a right fork

202



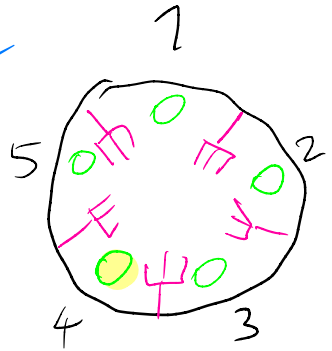
2 has taken a left fork

207



5 has taken a left fork

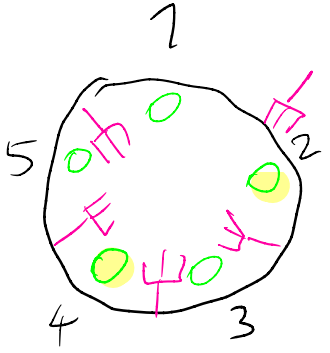
202



2 is eating

drop forks

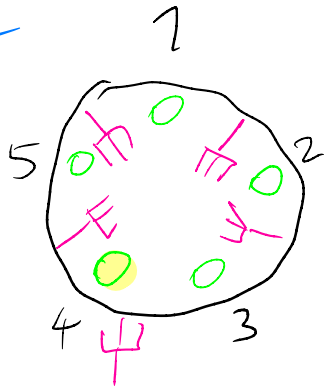
207



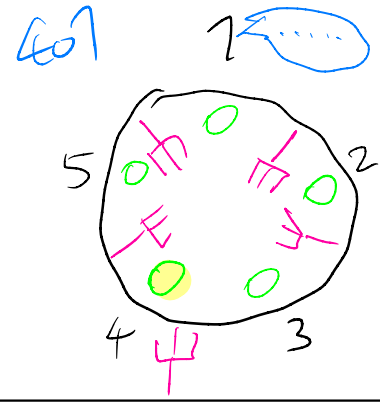
5 is eating

drop forks

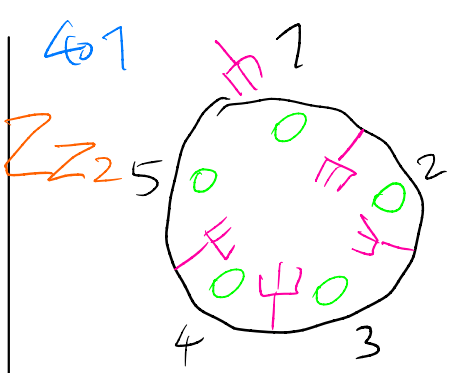
202



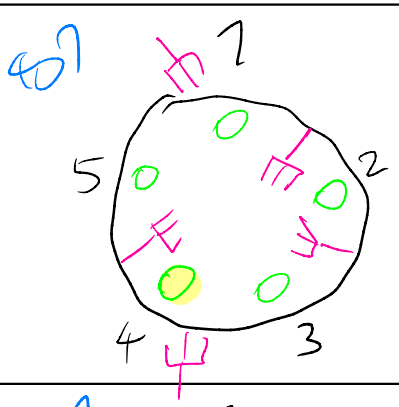
4 has taken a right fork



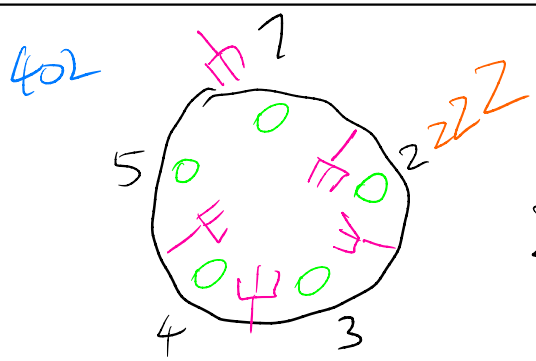
1 is thinking



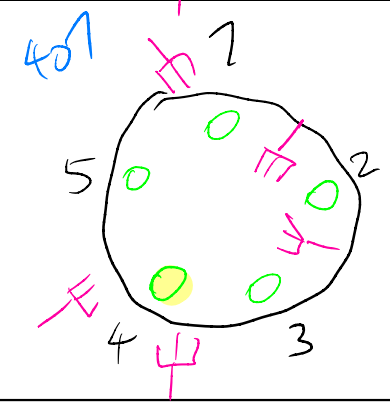
5 is sleeping



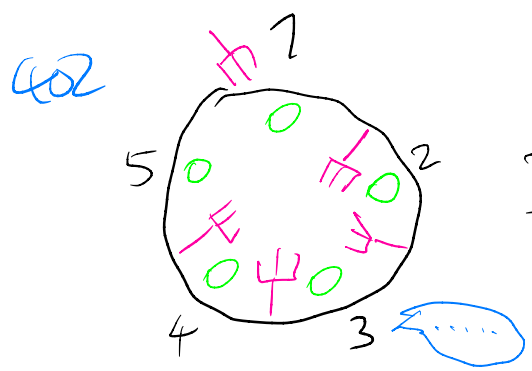
1 has taken a right fork



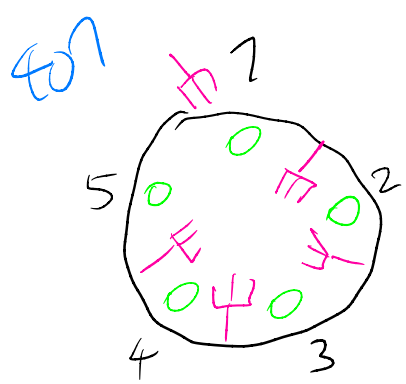
2 is sleeping



4 has taken a left fork

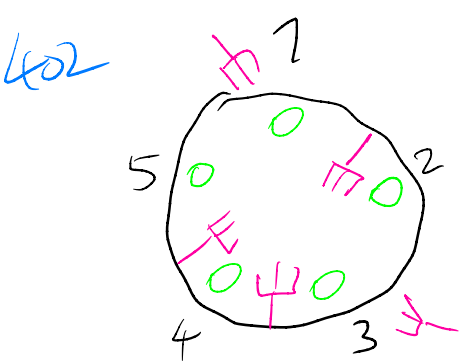


3 is thinking

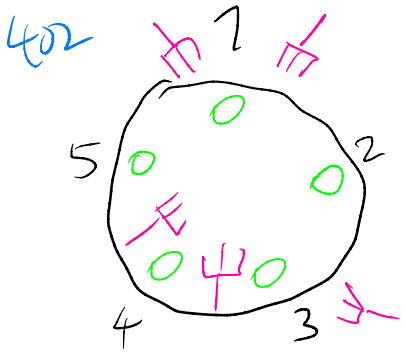


4 is eating

drop ~~forks~~

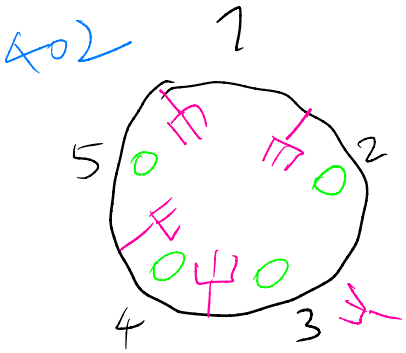


3 has taken a right fork



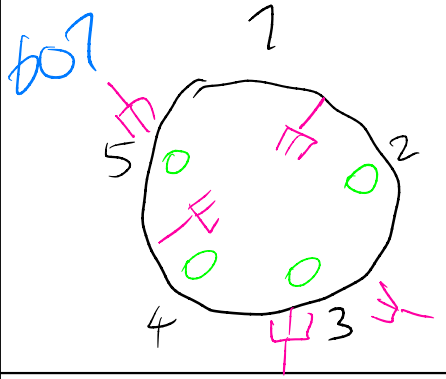
1 has taken a left fork

4 is sleeping

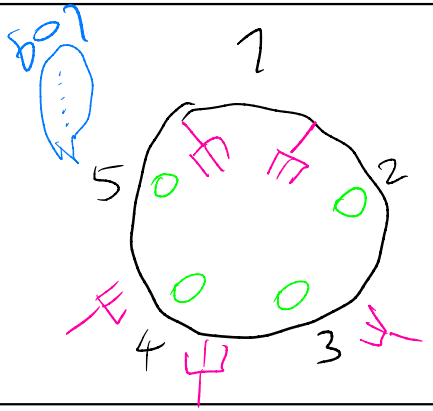


1 is eating

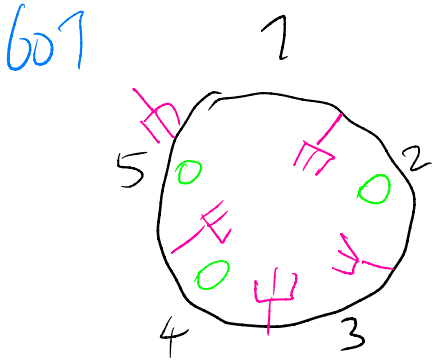
drop ~~forks~~



3 has taken a left fork

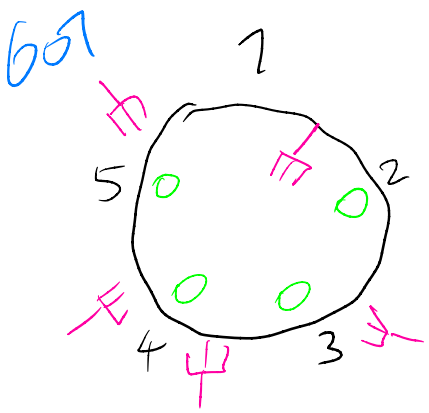


5 is thinking

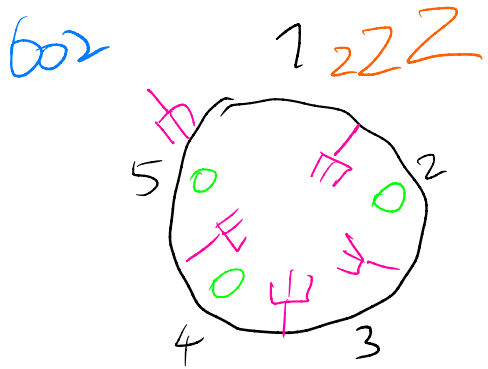


3 is eating

drop ~~forks~~

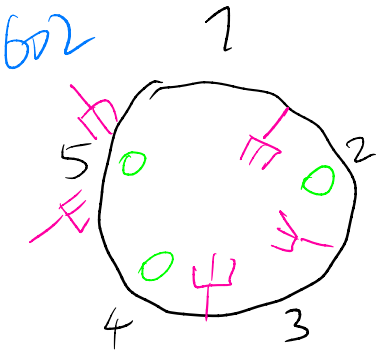


5 has taken a left fork



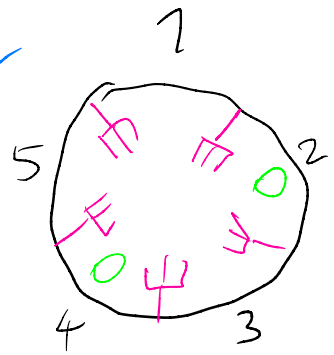
1 is sleeping

602



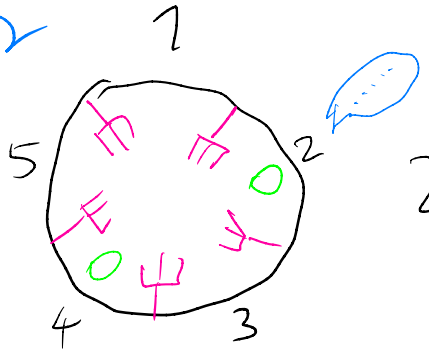
5 has taken a right fork

602



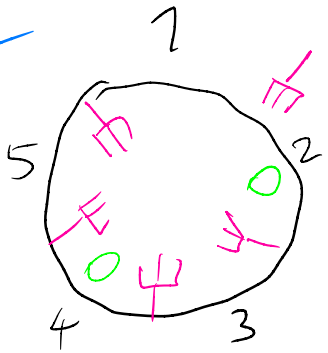
5 is eating drop forks

602



2 is thinking

602



2 has taken a right fork