



```
sysctl hw.logicalcpu
```



```
sysctl hw.physicalcpu
```

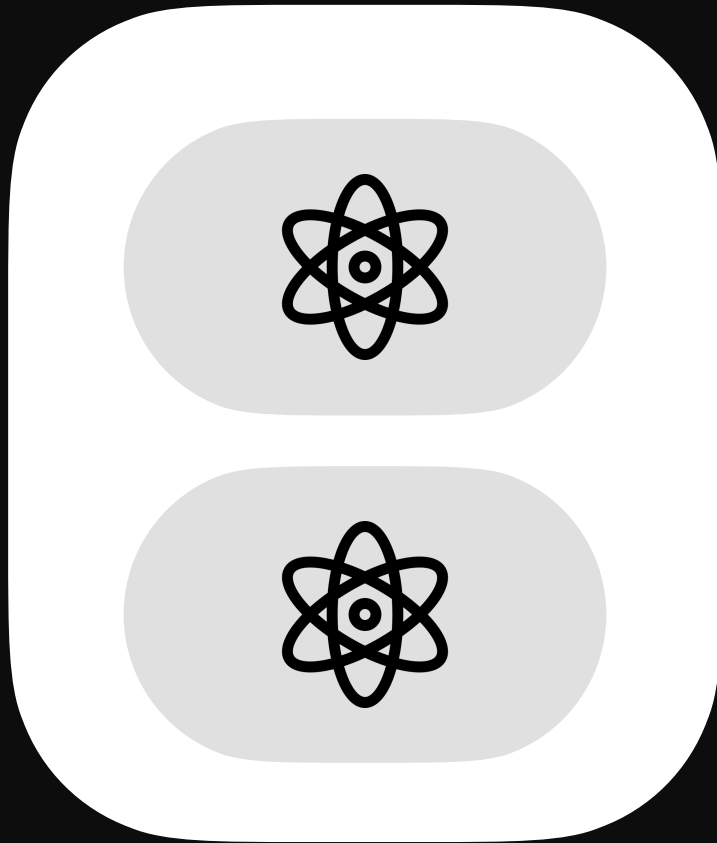


```
sysctl hw.ncpu
```

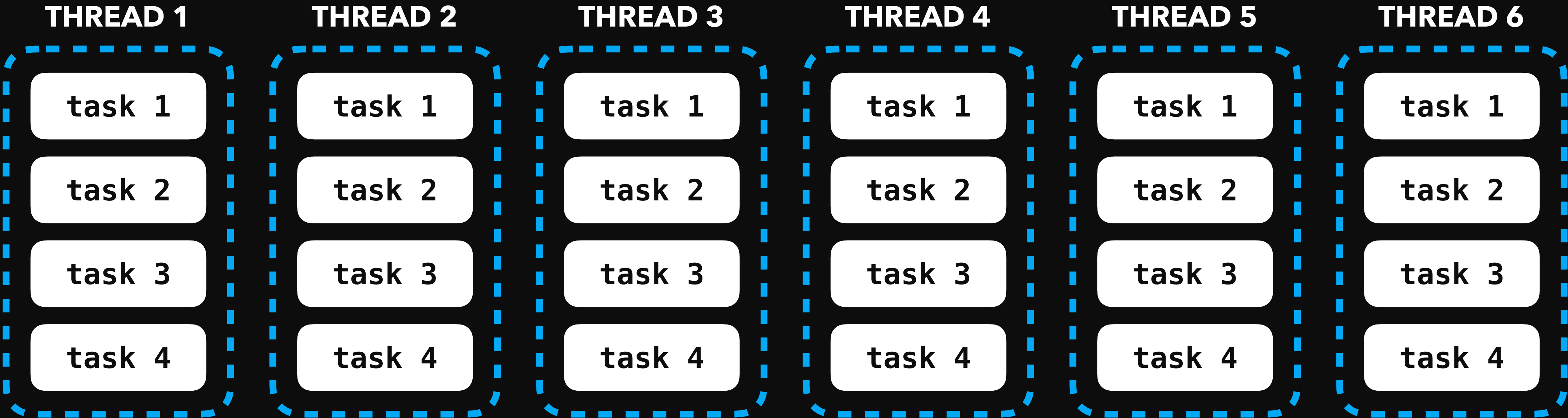


```
sysctl -a | grep machdep_cpu | grep count
```

PHYSICAL CORE



OS Kernel



**Operating System**



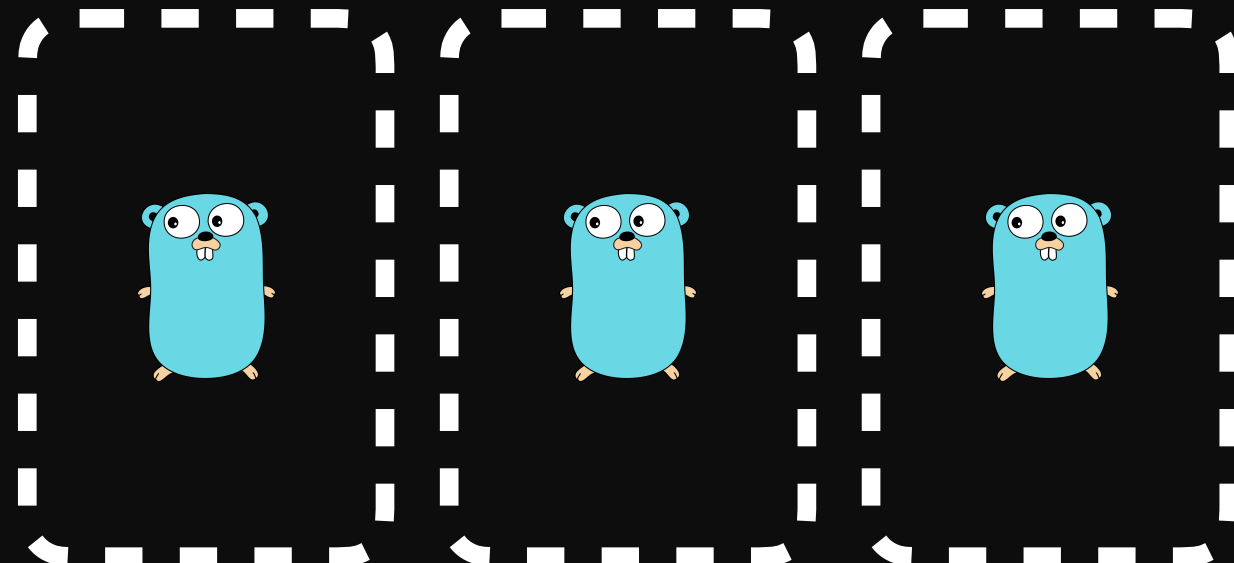
**OS Kernel**



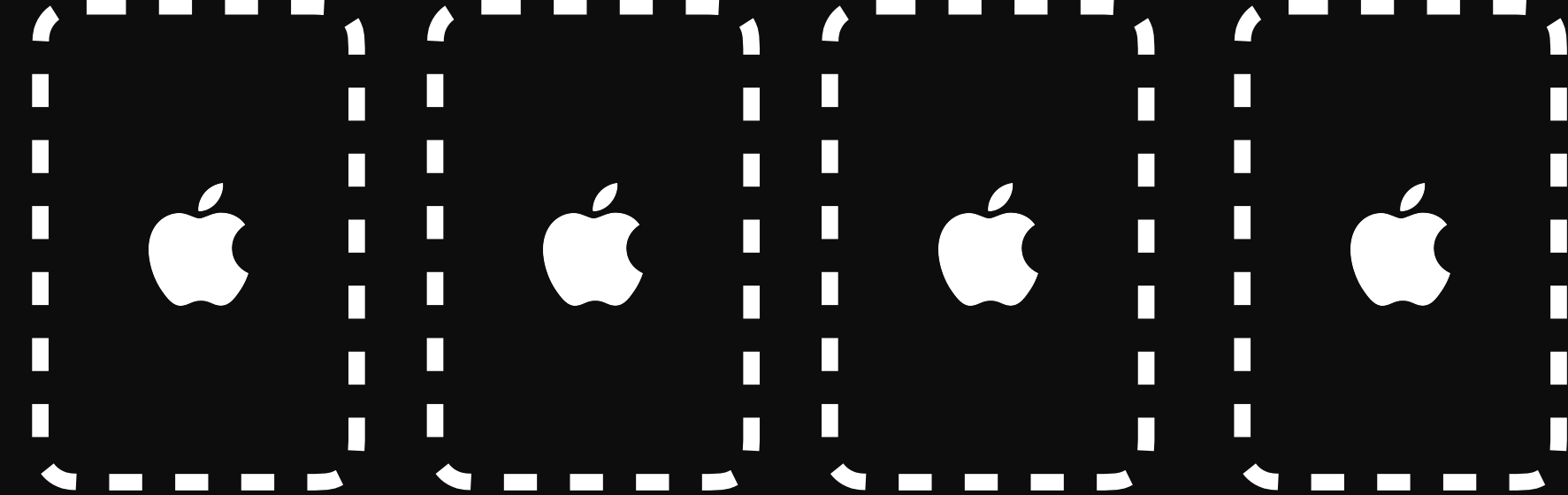
**User Level Threads**



**steevehook**



**Kernel Level Threads**



## THREAD



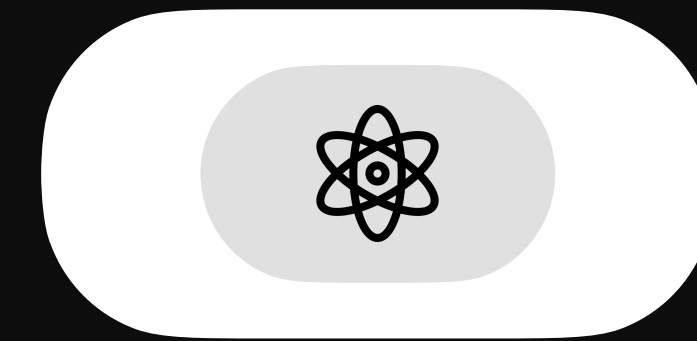
 1s

 0.2s

 0s

 0.1s

## LOGICAL CORE



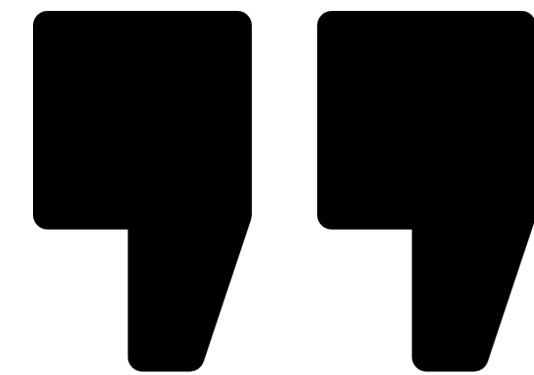
task 3

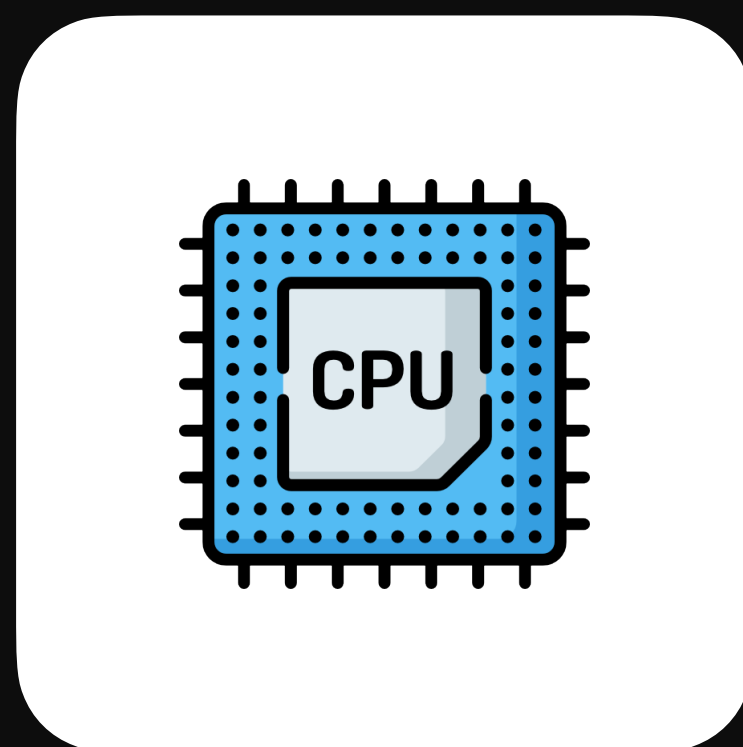
task 4

task 2

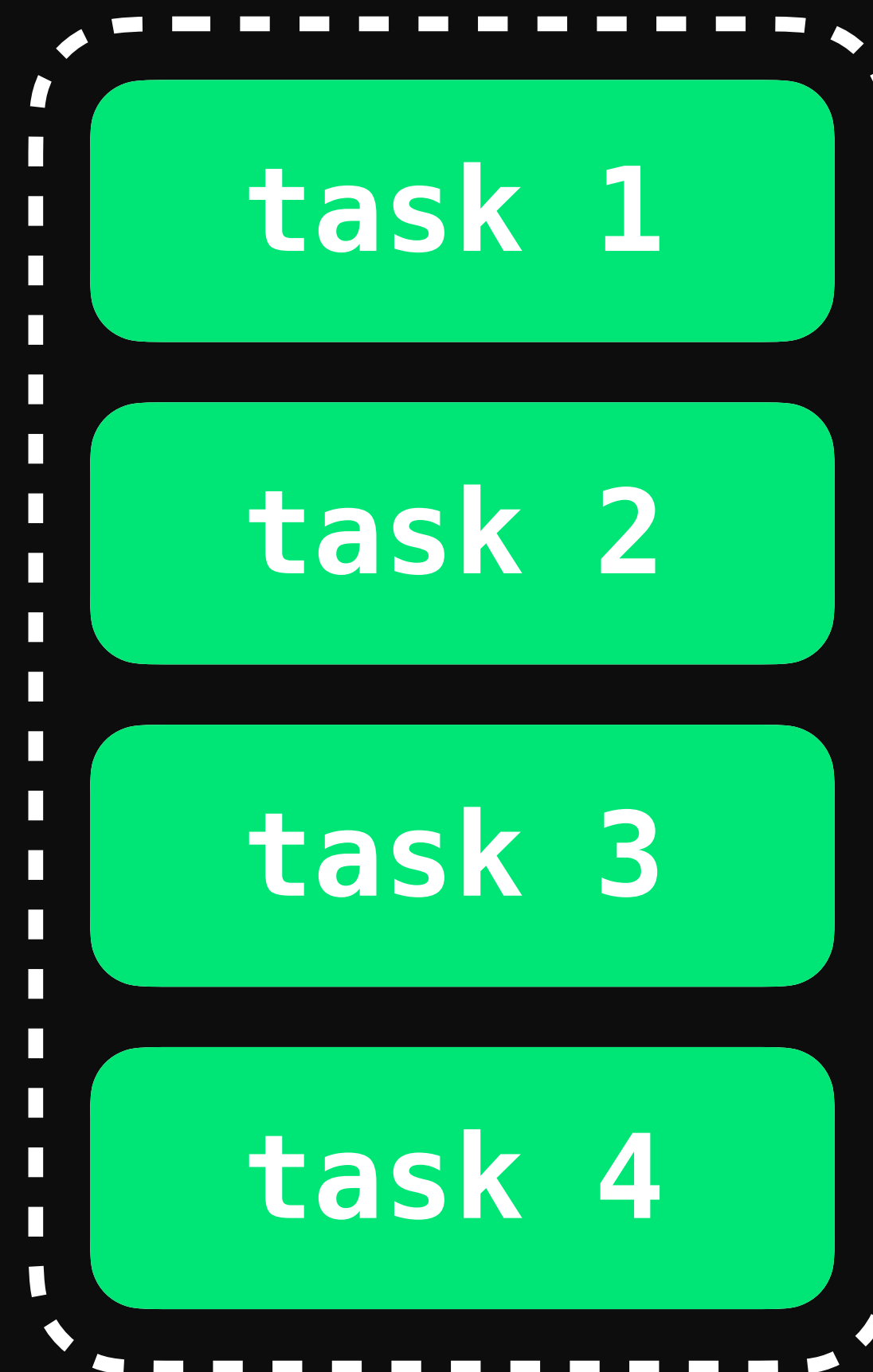
task 1

**Concurrency** is **DEALING** with a lot of things at the same time. **Parallelism** is **DOING** a lot of things at the same time.





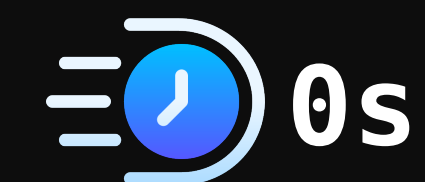
5ms



1s



0.2s



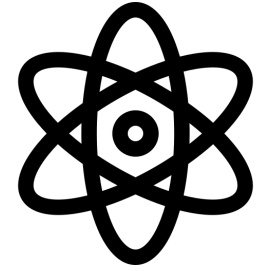
0s



0.1s



## CORE 1



5ms 

task 1


task 2

task 3

task 4

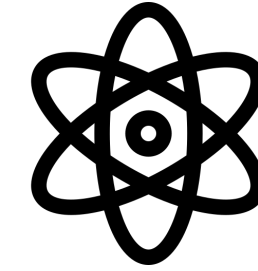
 1s

 0.2s

 0s

 0.1s

## CORE 2



5ms 

task 5

task 6

task 7

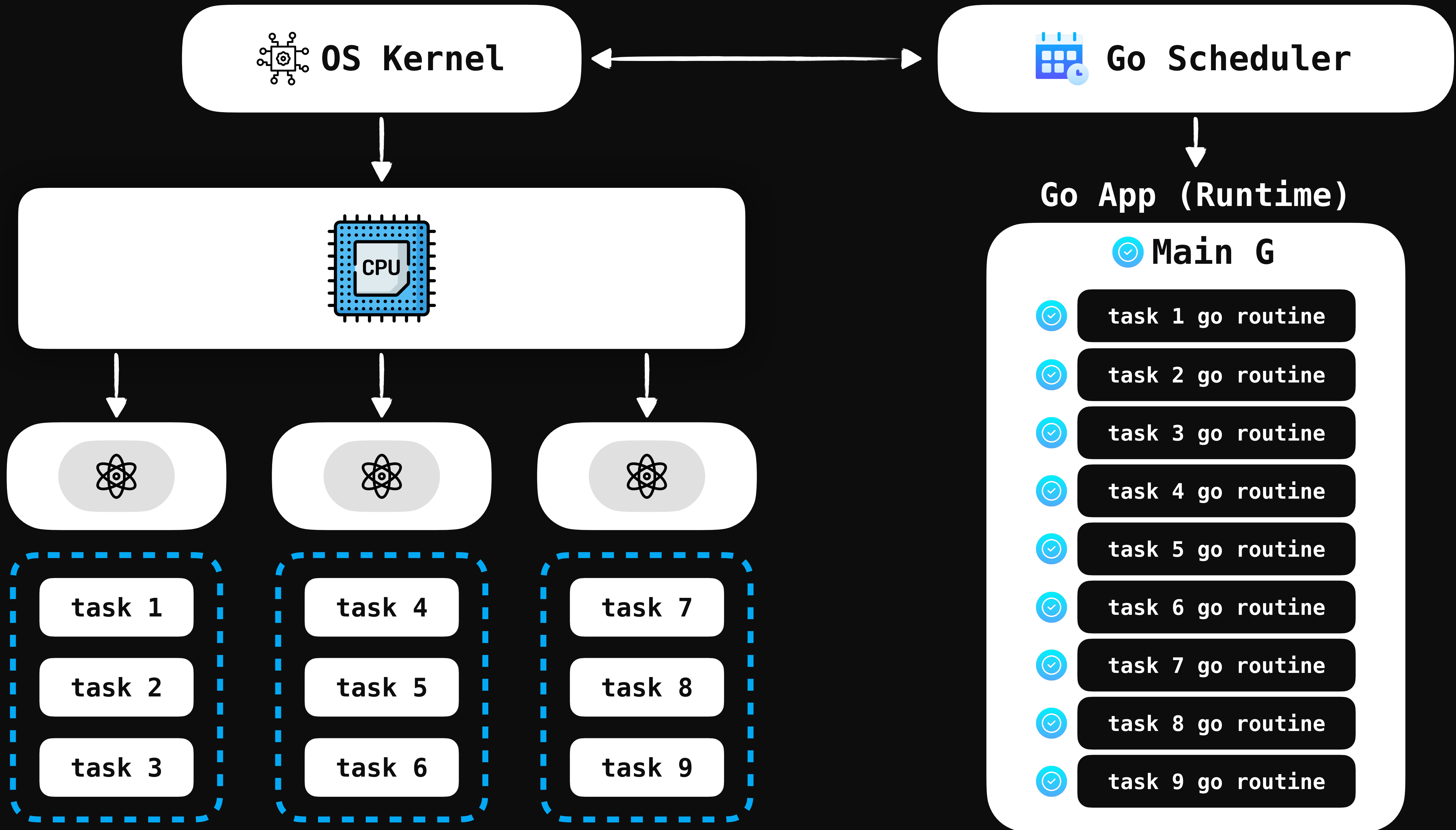
task 8

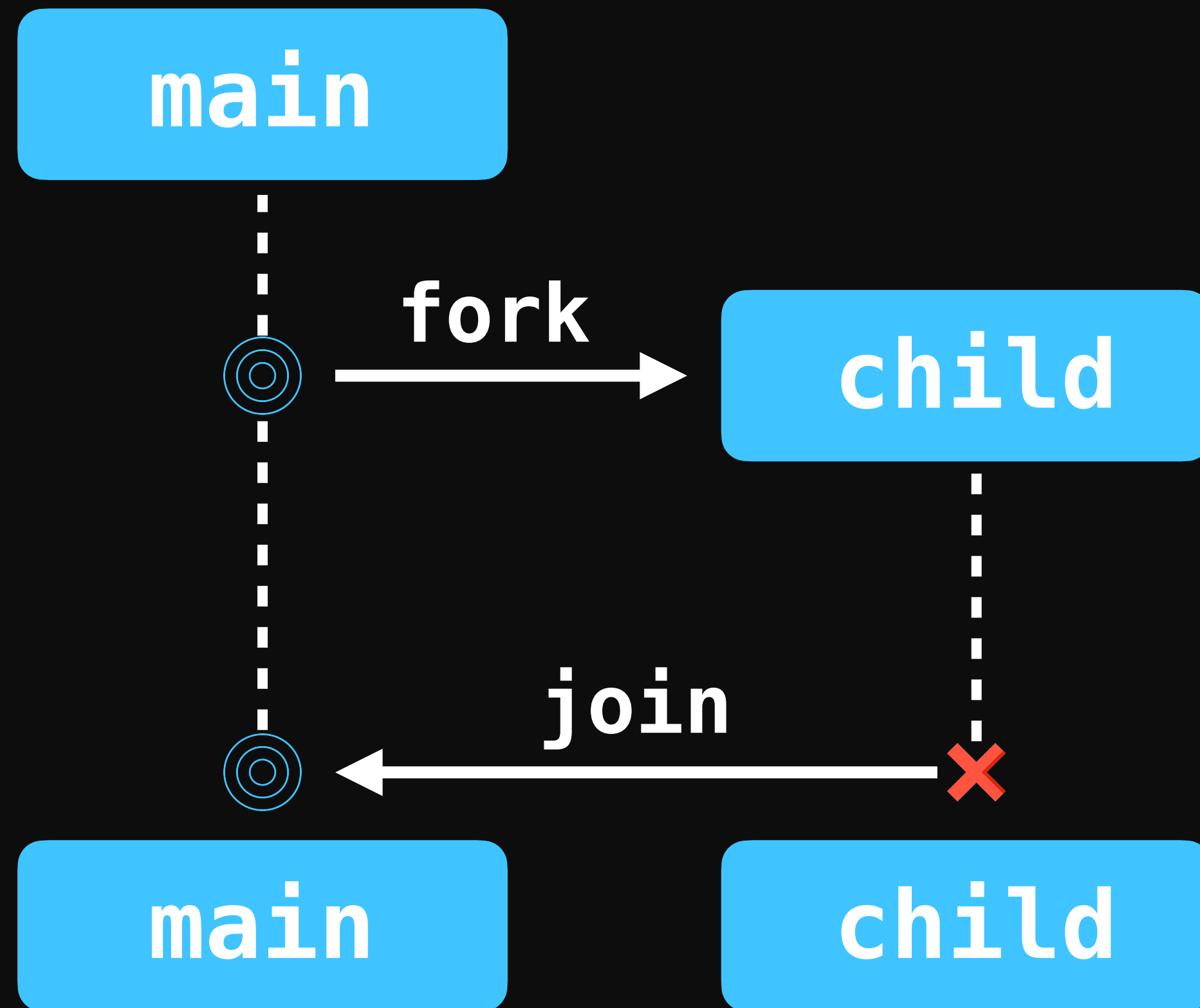
 0.5s

 0.3s

 0.1s

 0.2s







**race conditions**



**deadlocks**



**livelocks**



**starvation**



**code complexity**