Lec-17

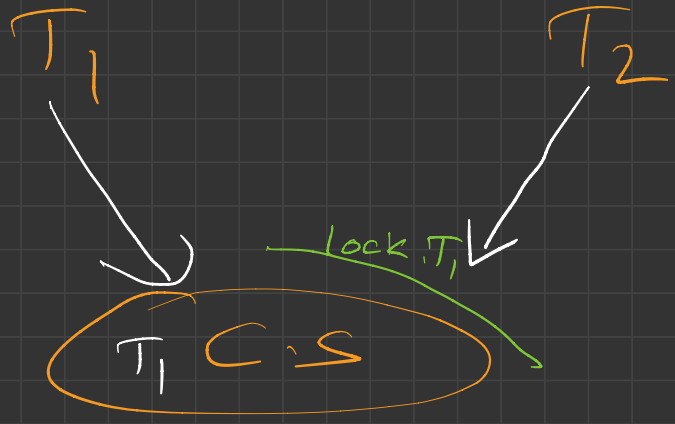
① — single flag ✗

② — Peterson's soln 2 threads

③ — Locks / Mutex

↓

Problems ⟹ Busy waiting



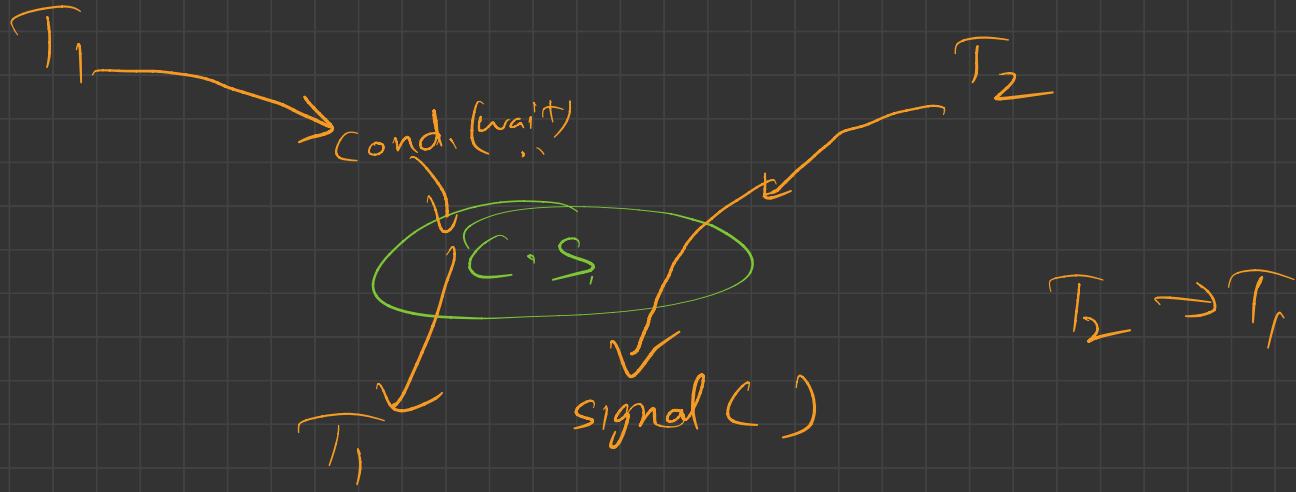
while (flag);

* Conditional Variables :-

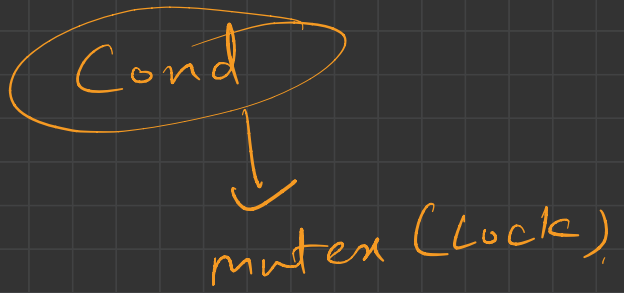
var => cond (lock)

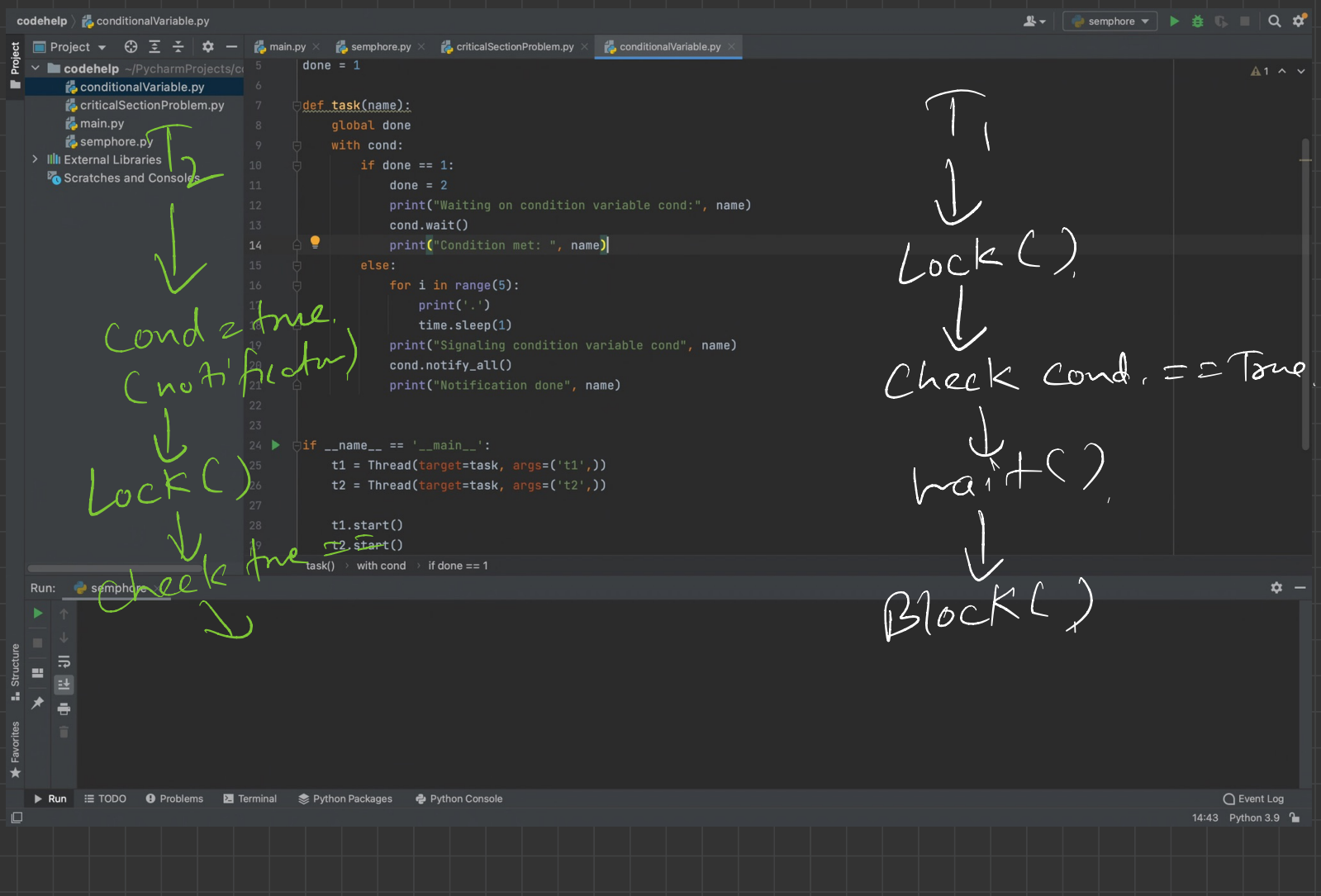
wait

signal



$T_2 \rightarrow T_1$

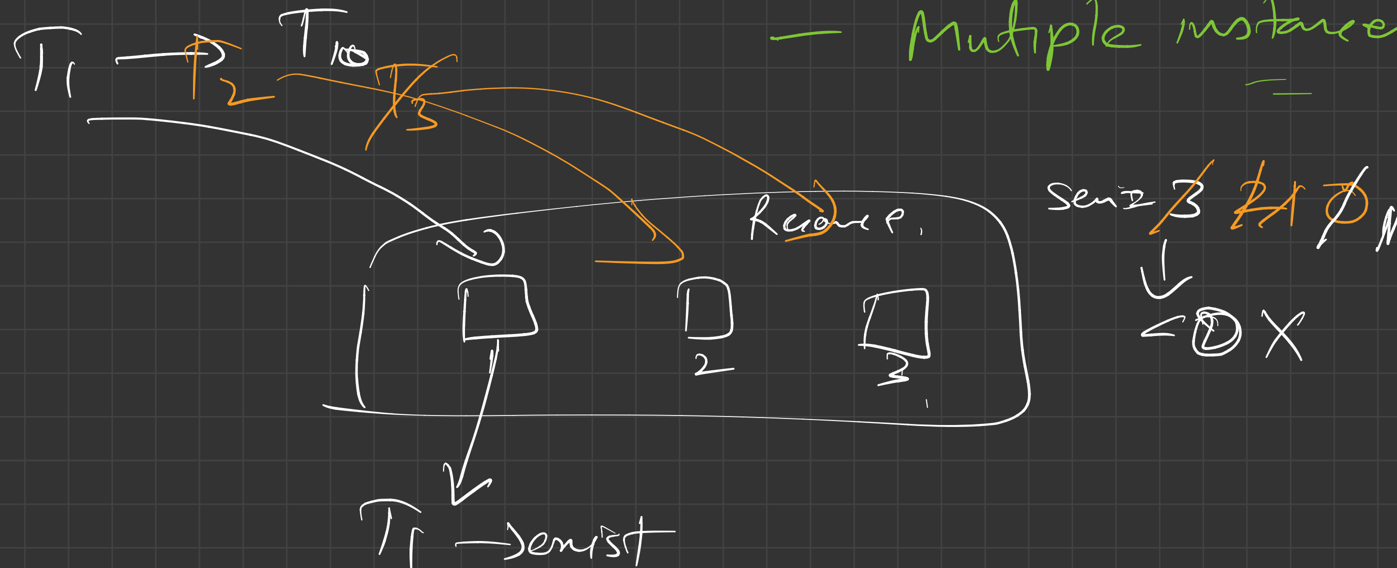

Cond
mutex (lock)


codehelp
conditionalVariable.py
semphore
Project
codehelp ~/PycharmProjects/c
conditionalVariable.py
criticalSectionProblem.py
main.py
semphore.py
External Libraries
Scratches and Consoles
main.py
semphore.py
criticalSectionProblem.py
conditionalVariable.py
done = 1
def task(name):
global done
with cond:
if done == 1:
done = 2
print("Waiting on condition variable cond:", name)
cond.wait()
print("Condition met: ", name)
else:
for i in range(5):
print('.')
time.sleep(1)
print("Signaling condition variable cond", name)
cond.notify_all()
print("Notification done", name)
if __name__ == '__main__':
t1 = Thread(target=task, args=('t1',))
t2 = Thread(target=task, args=('t2',))
t1.start()
t2.start()
task() › with cond › if done == 1
Run:
semphore
Run
TODO
Problems
Terminal
Python Packages
Python Console
Event Log
14:43
Python 3.9
T2
Cond = true
(notification)
Lock()
Check
T1
Lock()
Check Cond. == True
wait()
Block()

Semaphores → integer

Resource → Single X

— Multiple instances



wait()
C.S
signd.

```
wait(S)
{
    S->value--;
    if(S->value<0)
    {
        add to S->blockList
        Block();
    }
}
```

Semaphore S(2);

```
Signal(S)
{
    S->value++
    if(S->value<=0)
    {
        remove P from S->BlakList
        wakeup(P)
    }
}
```

T_1 → wait() → S->val=1 → After C.S → signd

T_2 → wait() → S->val=0 →

T_3 → wait() → S->val → -1 → Block()

CPU.

Semaphore → n → 1 → Binary semaphore.

Semaphore → >1 → Counting semaphore