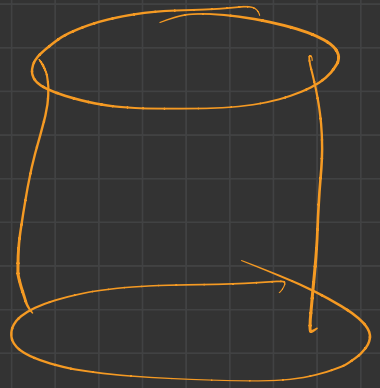
Lec-19

Reader writer problem

(1) Reader thread → Read

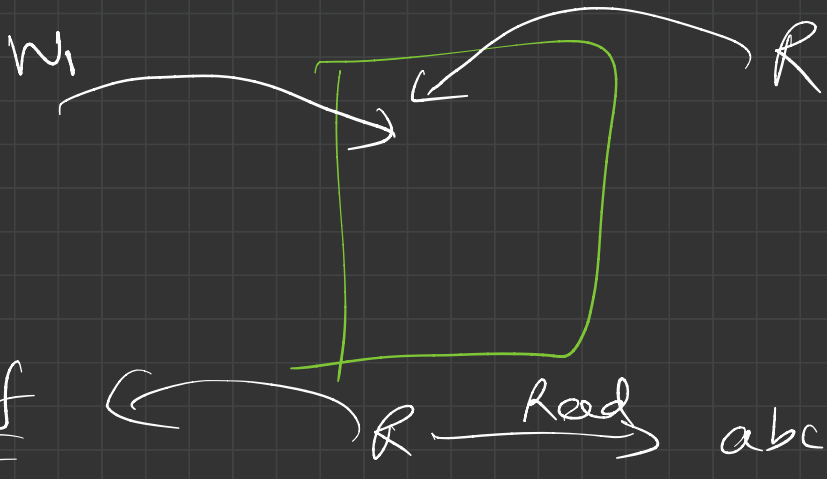
(2) writer threads → write update



(1) if >1 Readers are reading → No issue ✗

② >1 writers OR 1 writer & some other thread (R/W), parallely,

→ Race condition & data inconsistent



Semaphors soln to R-W problem

(1) mutex → Binary semaphore
- to ensure mutual exclusion, when read count (rc) is updated.
- No. two threads modify R.C at same time.

(2) wrt → Binary semaphore,
- common for both reader, writer.

(3) read count (rc) → integer [0],
tracks how many readers are reading in C.S

Writer Soln

```
do {
    wait (wrt);
    // do write operation.
    signal (wrt);
} while ( true );
```

Reader soln

```
do{
    wait (mutex) ; // to mutex readcount variable
     rc++;
     if (rc==1)
        wait (wrt) ; // ensures no writer can enter if there is
                     // even one reader

      signal(mutex) ;

// C.S : Reader is reading

     wait (mutex)
     rc--; // a reader leaves

     if( rc==0) // no reader is left in CS
        signal(wrt) ; // writer can enter
      signal(mutex) ; // reader leaves
} while (1)
```

Soln: