

Date: 27-11-21

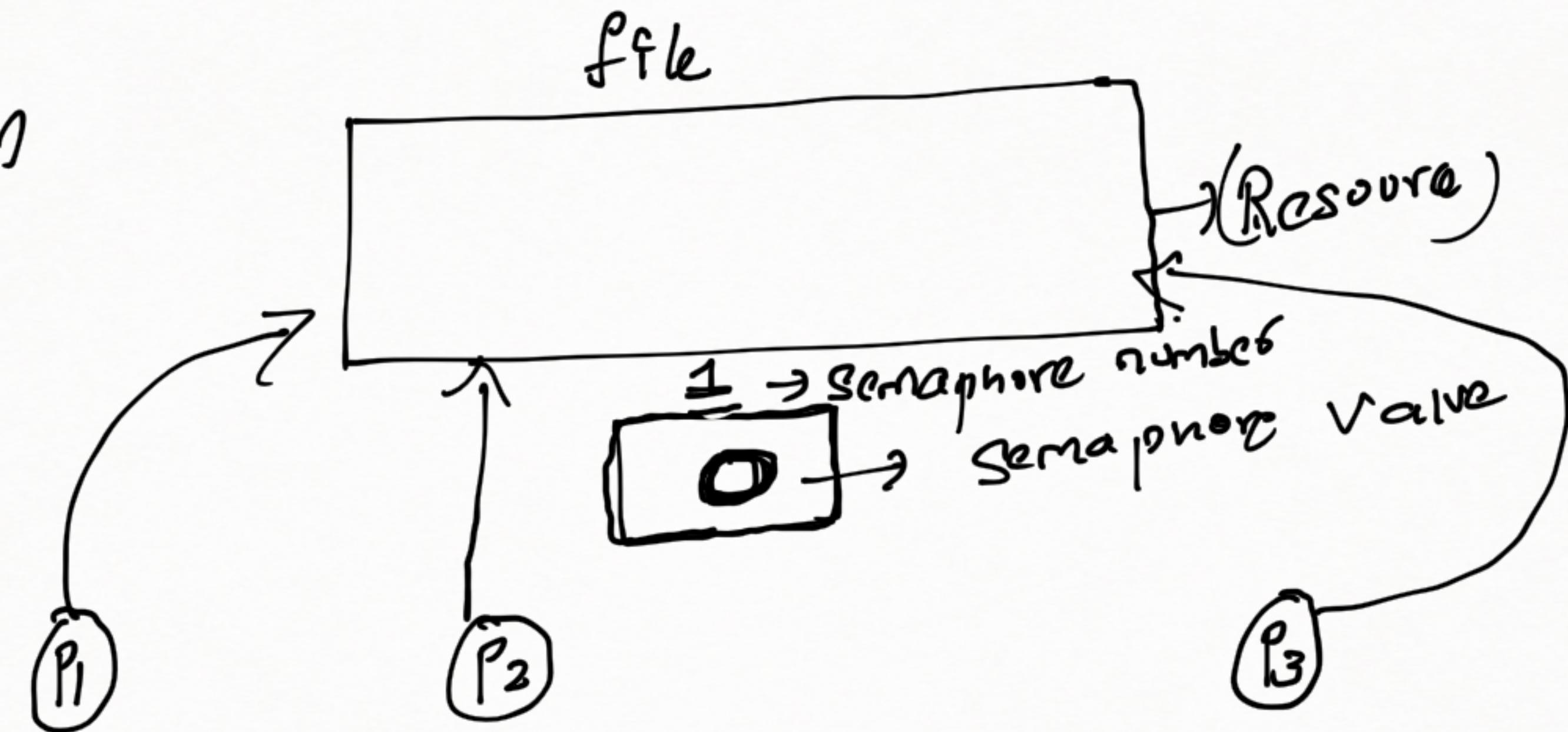
→ w4q To create 3 processes (P_1, P_2, P_3), P_1 process will write lower case letters into file, P_2 process will write uppercase letters and P_3 process will write digits (numeric chars) into file.

order of execution

$P_1 \rightarrow$ write

$P_2 \rightarrow$ write

$P_3 \rightarrow$ write



P₁

$$V. \text{sem_num} = 1;$$

$$V. \text{sem_op} = 0; \checkmark$$

$$V. \text{sem_flg} = 0;$$

semop(fd, &v, 1);

critical section
of code P₁

$$V. \text{sem_num} = 1;$$

$$V. \text{sem_op} = 1; \checkmark \Rightarrow \text{semval} = \text{semval} + \text{semop}$$

$$V. \text{sem_flg} = 0;$$

semop(fd, &v, 1)

P₂ ✓

$$V. \text{sem_num} = 1$$

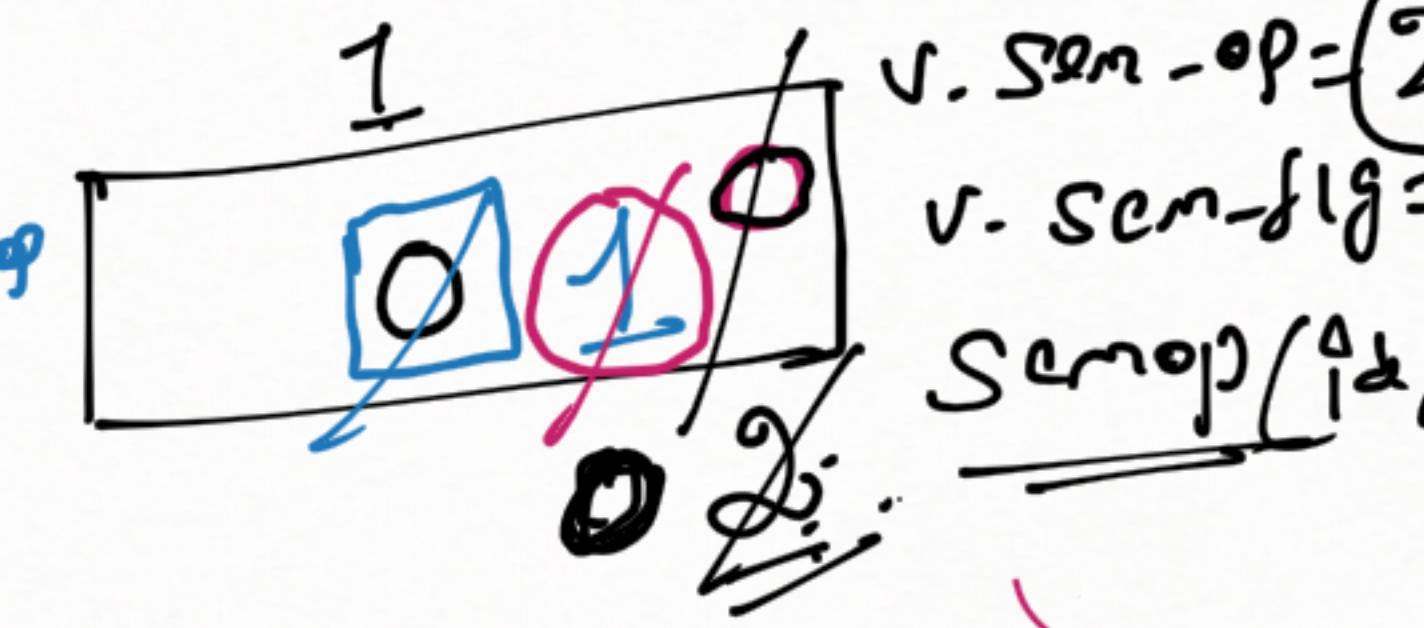
$$V. \text{sem_op} = -1; \checkmark$$

$$V. \text{sem_flg} = 0;$$

semop(fd, &v, 1);

critical section
of code P₂

$$V. \text{sem_num} = 1$$



$$V. \text{sem_op} = 1; \checkmark \Rightarrow \text{semval} = \text{semval} + \text{semop}$$

$$V. \text{sem_flg} = 0;$$

semop(fd, &v, 1)

P₃ ✓

$$V. \text{sem_num} = 1$$

$$V. \text{sem_op} = -2; \checkmark$$

$$V. \text{sem_flg} = 0;$$

semop(fd, &v, 1);

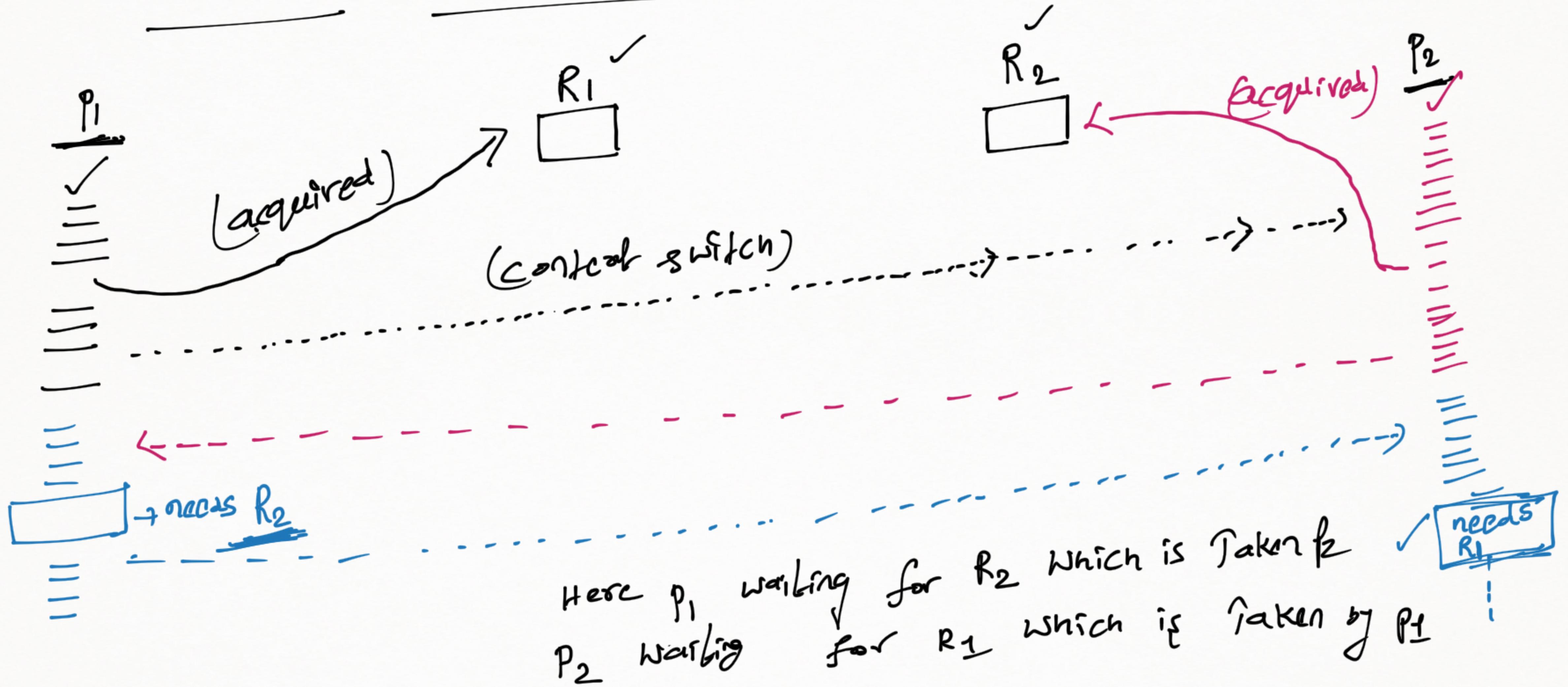
critical section
of code P₃

$$\text{semval} = \begin{cases} \text{sem_op} \\ \text{---} \end{cases}$$

$$2 = -2$$

$$2 = 2$$

→ What is deadlock situation?



→ p_1 and p_2 processes are continuously waiting for resources
they are not changing their state this situation where
processes are not changing their state is called
process Dead Lock

P₁

Struct Sembuf V[2]

$$\left\{ \begin{array}{l} V[\emptyset] \cdot \text{sem-num} = \emptyset; \checkmark \\ V[\emptyset] \cdot \boxed{\text{sem-op} = \emptyset}; \\ V[\emptyset] \cdot \text{sem-flg} = \emptyset; \end{array} \right.$$

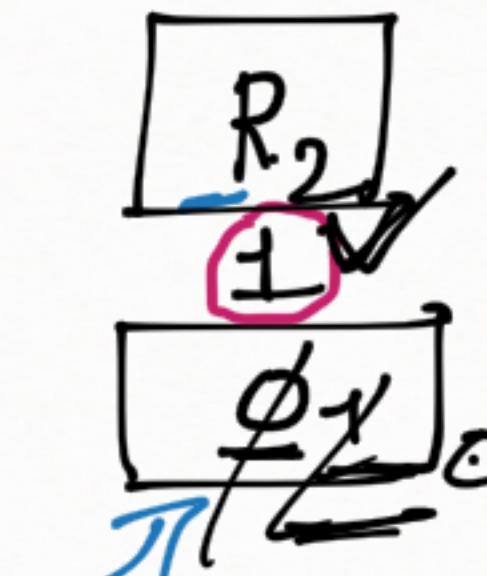
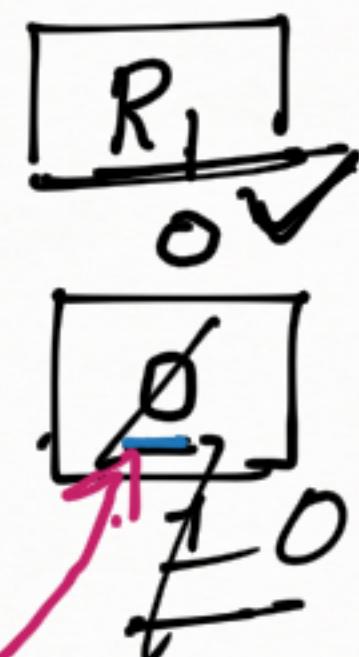
$$V[1] \cdot \text{sem-num} = 1; \checkmark$$

$$V[1] \cdot \boxed{\text{sem-op} = \emptyset};$$

$$V[1] \cdot \text{sem-flg} = \emptyset;$$

Semop(fd, V, 2)

Semctl(fd, 0, SCIVAL, 1) ✓
Semctl(fd, 1, SCIVAL, 1) ✓
Semctl(fd, 1, SCIVAL, 1)



P₂

Struct Sembuf V[2]

$$V[\emptyset] \cdot \text{sem-num} = \emptyset; \checkmark$$

$$V[\emptyset] \cdot \boxed{\text{sem-op} = \emptyset};$$

$$V[\emptyset] \cdot \text{sem-flg} = \emptyset;$$

$$V[1] \cdot \text{sem-num} = 1; \checkmark$$

$$V[1] \cdot \boxed{\text{sem-op} = \emptyset};$$

$$V[1] \cdot \text{sem-flg} = \emptyset;$$

Semop(fd, V, 2)

cortical sediments

↓
Semctl(fd, 0, SCIVAL, 0);

Semctl(fd, 1, SCIVAL, 1);

\Rightarrow semop() sys call
Semaphores Tasked

Code

\checkmark semop(fd, &v, 1)

Third argument represents number of
before entering into critical section of
struct sembuf V[2]

semop(fd, v, 2)

\rightarrow Two semaphores are
Tasked

\checkmark semop(fd, v, 32)
 \rightarrow (max value)

\rightarrow Scnd (5, 250, TIPC-CREATE [0.644])
Scnd (10, 250, TIPC-CREATE [0.644])

128 \times 250 = 32000

0	1	2	...	249
0	1	0	0

✓

250 \times 128 ✓

2000

00

250

320000

1

