

## 38<sup>th</sup> Day

### Semaphore

#### Code1

```
module tb;

semaphore key=new(1);

initial

begin
    repeat(2)
        fork
            begin
                $display("p1 is trying to get key at time %0t", $time);
                key.get();
                $display("p1 got the key at time %0t", $time);
                #10;
                key.put();
                $display("p1 put the key at time %0t", $time);
            end

            begin
                $display("p2 is trying to get key at time %0t", $time);
                key.get();
                $display("p2 got the key at time %0t", $time);
                #10;
                key.put();
                $display("p2 put the key at time %0t", $time);
            end
        end
    end
end
```

join

end

endmodule

## Simulation

Compiler version U-2023.03-SP2\_Full64; Runtime version U-2023.03-SP2\_Full64; May 1 10:23 2025

p1 is trying to get key at time 0  
p1 got the key at time 0  
p2 is trying to get key at time 0  
p1 put the key at time 10  
p2 got the key at time 10  
p2 put the key at time 20  
p1 is trying to get key at time 20  
p1 got the key at time 20  
p2 is trying to get key at time 20  
p1 put the key at time 30  
p2 got the key at time 30  
p2 put the key at time 40

V C S   S i m u l a t i o n   R e p o r t

Time: 40 ns

## Code 2

```
module tb;
```

```
    semaphore key=new(2);
```

```
    initial
```

```
    begin
```

```
        repeat(2)
```

```
        fork
```

```
        begin
```

```
            $display("p1 is trying to get key at time %0t", $time);
```

```
            key.get(2);
```

```
            $display("p1 got the key at time %0t", $time);
```

```
            #10;
```

```
            key.put(1);
```

```
            $display("p1 put only 1 key at time %0t", $time);
```

```
            #5;
```

```
            key.put(1);
```

```
            $display("p1 put 2 keys at time %0t", $time);
```

```
        end
```

```
    begin
```

```
        $display("p2 is trying to get key at time %0t", $time);
```

```
        key.get(2);
```

```
        $display("p2 got the key at time %0t", $time);
```

```
        #10;
```

```
        key.put(1);
```

```

        $display("p2 put only 1 key at time %0t", $time);

        #5;

        key.put(1);

        $display("p2 put 2 keys at time %0t", $time);

    end

join

end

endmodule

```

## Simulation

```

Compiler version: 2023.03 64-bit, Runtime version: 2023.03 64-bit, May 1 10:47 2023.
p1 is trying to get key at time 0
p1 got the key at time 0
p2 is trying to get key at time 0
p1 put only 1 key at time 10
p1 put 2 keys at time 15
p2 got the key at time 15
p2 put only 1 key at time 25
p2 put 2 keys at time 30
p1 is trying to get key at time 30
p1 got the key at time 30
p2 is trying to get key at time 30
p1 put only 1 key at time 40
p1 put 2 keys at time 45
p2 got the key at time 45
p2 put only 1 key at time 55
p2 put 2 keys at time 60
VCS Simulation Report
Time: 60 ns

```