

// EECS 111

// Gaurav Venkatesh

Suppose that university wants to show off how politically correct it is by applying the U.S. Supreme Court's "Separate but equal is inherently unequal"

doctrine to gender as well as race, ending its long-standing practice of gender-segregated bathrooms on campus. However, as a concession to tradition, it decrees

that when a woman is in a bathroom, other woman may enter, but no men, and vice versa. A sign with a sliding marker on the door of each bathroom indicates which

of three possible states it is currently in:

q Empty

q Woman present

q Men present

In some programming language you like, write the following procedures: `woman_wants_to_enter ()`, `man_wants_to_enter ()`, `woman_leaves ()`, `man_leaves ()`.

*Simple Solution*

// 3 states occupied 0 = empty, occupied 1 = men, occupied -1 = female.

int occupied = 0;

int numb = 0;

woman\_wants\_to\_enter (){

    while(occupied > 0 ); //wait indefinitely

    occupied = -1;

    numb = numb ++;

}

man\_wants\_to\_enter (){

    while (occupied < 0 ); // wait indefinitely

    occupied =1;

    numb = numb ++;

}

```
woman_leaves (){
    numb--;
    if(numb == 0) occupied = 0;
}
man_leaves ().{
    numb--;
    if(numb == 0) occupied = 0;
}
```

*Solution ending starvation*

**// 3 states occupied 0 = empty, occupied 1 = men, occupied -1 = female.**

**// lets assume n to be 5, after 5 people went to the bathroom it can be used by another gender**

```
int occupied = 0;
```

```
int numb = 0;
```

```
int n = 0;
```

**//If occupied is greater than 0 then it will wait and also increment number of women and variable n to keep track of how many women have already gone**

```
woman_wants_to_enter (){
    while(occupied > 0 ); //wait indefinitely
    occupied = -1;
    numb = numb ++;
    n++;
}
```

**//If occupied is less than 0 then it will wait and also increment number of men and variable n to keep track of how many men have already gone**

```
man_wants_to_enter (){
    while (occupied < 0 ); // wait indefinitely
    occupied =1;
    numb = numb ++;
    n++;
}
```

**// If n =5 then it will automatically switch it to men so no starvation**

**// if numb of men = 0; then it will turn it to 0 so that anybody can use it next**

```
woman_leaves (){
    numb --;
    if(n >=5){
        occupied = 1;
        n = 0;
    }
    if(numb == 0) {
        occupied = 0;
    }
}
```

**// If n =5 then it will automatically switch it to women so no starvation**

**// if numb of men = 0; then it will turn it to 0 so that anybody can use it next**

```
man_leaves ().{
    numb --;
    if(n >=5){
        occupied = -1;
        n = 0;
    }
}
```

```
        if(numb == 0) occupied = 0;  
    }
```