

# Operating Systems

## HW Sheet # 3

Submitted by: Neeha Hammad

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### Problem 3.1:

(a)

```
int sem_init(sem_t, bar, person);
sem_t c;
sem_t d;
```

```
struct Semaphore{
    int value;
    Queue<process>q1;
    Queue<process>q2;
}
```

```
client_visit_bar(bar_t *bar, person_t person)
{
    sem_wait(&c);
    q1.push();

    if(detectives == 0)
    {
        while (clients > 0 && detectives == 0)
        {
            sem_wait(&c);
        }
    }
    else
    {
        sem_wait(&d);
        q2.pop();
    }
}
```

```

        sem_wait(&c);
        q1.pop();
    }
    sem_post(&c);
    sem_post(&d);
}

```

**detective\_visit\_bar**(bar, person) {

```

    sem_wait(&c);
    q2.push();

    if (clients == 0) {
        while (detectives > 0 && clients == 0) {
            sem_wait(&d);
        }
    }
    else {
        sem_wait(&d);
        q2.pop();

        while (clients) {
            sem_wait(&c);
            q1.pop();
        }
    }

    while (clients) {
        sem_wait(&c);
        q1.pop();
    }

    sem_post(&c);
}

sem_post(&d);
}

```

(b) If you are unable to compile the code at first, please try with a debugger using such a command:

```
gdb ./bar -c 1 -d 1
```

If the program goes into the second thread at first, it might not give you the desired results. In this case, re-run it until you get results similar to those given in the assignment sheet. It works (please see the screenshot attached)!