Operating Systems
HW Sheet # 3

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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)!