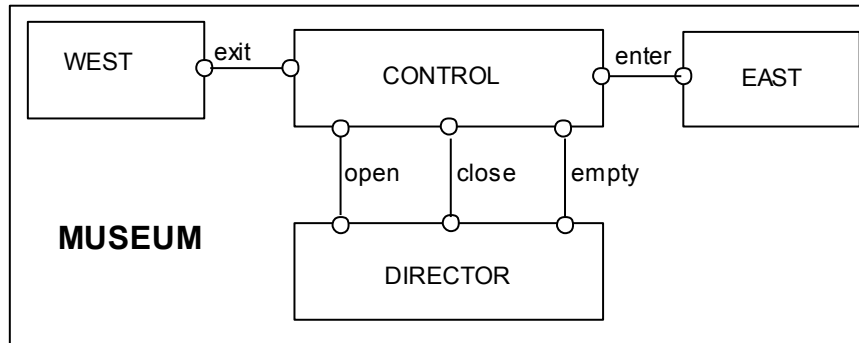


Concurrency

Museum Solution

1. <3 marks>



2. <5 marks>

```
const N = 5 //number of people in the museum

EAST = (enter -> EAST).

WEST = (exit -> WEST).

DIRECTOR = (open->close->empty->DIRECTOR).

CONTROL    = (open -> OPEN[0]),
OPEN[i:0..N] = (when (i<N) enter -> OPEN[i+1]
                |when (i>0) exit  -> OPEN[i-1]
                |close -> CLOSE[i]
                ),
CLOSE[i:0..N] = (when(i>0) exit -> CLOSE[i-1]
                |when(i==0)empty -> CONTROL
                ).

||MUSEUM = (EAST || WEST || CONTROL || DIRECTOR).
```

3. <2 marks>

```
TEST = CLOSED,
CLOSED = (open  -> OPENED | enter->ERROR),
OPENED = (enter -> OPENED | close-> CLOSED).
```

4. <1 marks>

```
Trace to DEADLOCK:
    open
    enter
    close
```