

3C03 Concurrency

Tutorial Session 4 - Work Sheet

This tutorial session will give you practical experience with model based design and concurrent programming in Java.

For that purpose we want to design a UML class model and provide details about the implementation of the FSP model of the ornamental garden model below.

```
const N = 3
range T = 0..N
COUNTER = COUNTER[0],
COUNTER[x:T] = (when (x>0) depart -> COUNTER[x-1]
                |when (x<N) arrive -> COUNTER[x+1]).
TURNSTILE = ( arrive -> TURNSTILE
              | depart -> TURNSTILE ).
||GARDEN =(east:TURNSTILE || west:TURNSTILE || {east,west}::COUNTER).
```

Exercise 1:

Design classes and their relationships that are needed for the implementation of the museum admission control system. Draw a UML class diagram to document your design.

Exercise 2:

Visitors cannot enter the garden if it is already too crowded and they can only leave the garden when there is actually somebody in the garden. Identify the monitor in your design and use condition synchronization to achieve the above goal.

Exercise 3:

Implement the design in Java.