

## Programming Language Concepts, CS2104 (15<sup>th</sup> October 2007)

### Tutorial 7 (Please prepare in advance)

**Exercise 1. (Executing Threads)** Execute the following example with help of the abstract machine.

```
local A B C in
  thread if A then B=true else B=false end end
  thread if B then C=false else C=true end end
  A=false
end
```

Just sketch the execution, the important point here is to understand how threads are created and executed.

**Exercise 2. (Threads)** Give the values for the variables after execution has terminated:

```
thread if X==1 then Y=2 else Z=2 end end
thread if Y==1 then X=1 else Z=2 end end
X=1
```

and also for:

```
thread if X==1 then Y=2 else Z=2 end end
thread if Y==1 then X=1 else Z=2 end end
X=2
```

**Exercise 3. (Stream)** Write a producer which would produce a list of squares (starting from N) and a consumer which would compute the min/max values. Write this as a concurrent program with two threads. Implement also:

- (i) consumer-driven concurrent computation
- (ii) use a bounded buffer of size 3

**Exercise 4. (Higher-Order)** Suggest how you may write a higher-order producer-consumer or program that is data-driven.