6SENG002W Concurrent Programming

FSP Process Analysis & Design Form

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1. FSP Process Attributes

Attribute	Value
Name	PRINTER
Description	This process is an individual process that models the printer's printing in a mutually exclusive manner.
Alphabet	alphabet(PRINTER) = {aquireLock, print, refill, releaseLock}
Number of States	12
Deadlocks (yes/no)	no
Deadlock Trace(s) (if applicable)	

2. FSP Process Code

FSP Process:

```
const MAX_SHEETS = 3
range PrintRange = 0..MAX_SHEETS
PRINTER(SHEETS = 3) = PRINT[SHEETS],
PRINT[s : PrintRange] =
        if (s > 0)
        then (aquireLock -> PRINTDOC[s])
        else if (s == 0)
        then (aquireLock -> refill -> releaseLock -> PRINT[MAX_SHEETS]),


PRINTDOC[j : 1..3] = (print -> releaseLock -> PRINT[j - 1]).
```

3. Actions Description

A description of what each of the FSP process' actions represents, i.e. is modelling. In addition, indicate if the action is intended to be synchronised (shared) with another process or asynchronous (not shared). (Add rows as necessary.)

Actions	Represents	Synchronous or Asynchronous
aquireLock	Represents getting the lock of the printer	Synchronous
refill	Represents the action related to refilling the sheets tray	Synchronous
releaseLock	Represents the action which releasing the control to the printer	Synchronous
print	Represents the printing action of the process	Synchronous

4. FSM/LTS Diagrams of FSP Process

Note that if there are too many states, more than 64, then the LTSA tool will not be able to draw the diagram. In this case draw small diagrams of the most important parts of the complete diagram.
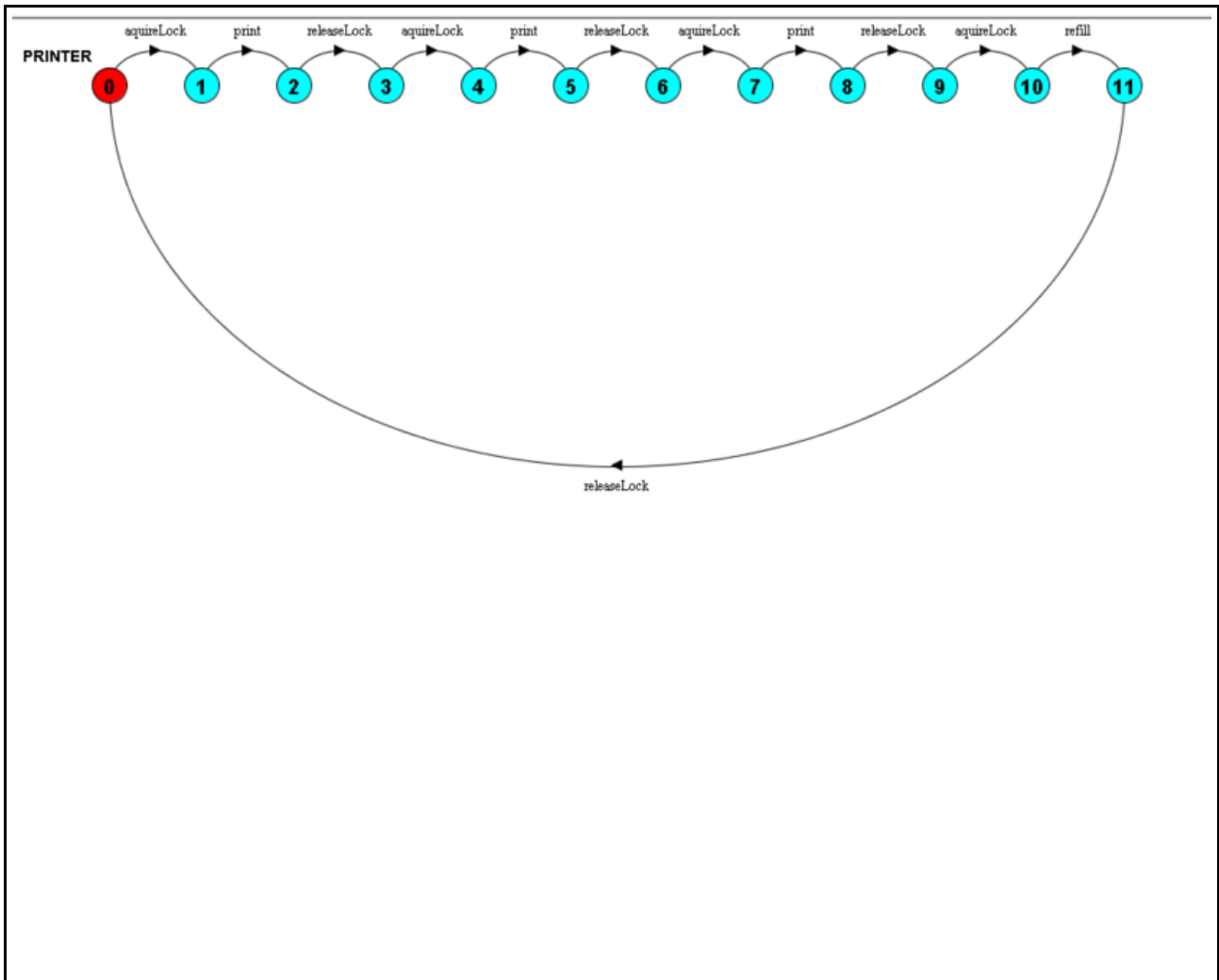
5. LTS States

A description of what each of the FSP process' states represents, i.e. is modelling. If there are a large number of states then you can group similar states together &/or only include the most important ones. For example, identify any states related to mutual exclusion (ME) & the associated critical section (CS), e.g. waiting to enter the CS state, in the CS state(s), left the CS state. (Add rows as necessary.)

State	Represents
0	Ready to acquire the lock (ready to enter CS state)
1	Ready to perform print (in the CS state)
2	Release the lock (exit from the CS state)
3	Ready to aqure the lock
4	Ready to perform print (in the CS state)
5	Release the lock (exit from the CS state)
6	Ready to acquire the lock (ready to enter CS state)
7	Ready to perform print (in the CS state)
8	Release the lock (exit from the CS state)
9	Ready to acquire the lock (ready to enter CS state)
10	Refill the paper tray (in the CS state)
12	Release the locl (exit the CS state)

6. Trace Tree for FSP Process

The trace tree for the process. Use the conventions given in the lecture notes and add explanatory notes if necessary.