6SENG002W Concurrent Programming

FSP Process Analysis & Design Form

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1. FSP Process Attributes

Attribute	Value
Name	PRINTER
Description	Models a printer that allows Students to print documents.
Alphabet	{print, refill, release, student_aquire, technician_aquire}
Number of States	12
Deadlocks (yes/no)	No
Deadlock Trace(s)	-

2. FSP Process Code

FSP Process: Printer

```
const MAX_SHEETS = 3
range PAPER_RANGE = 0..MAX_SHEETS
set PRINTING_ACTIONS = {student_aquire, technician_aquire, print, refill, release}

PRINTER (A = MAX_SHEETS) = PRINTINGMACHINE[A],
PRINTINGMACHINE [p : 0..A] = (
                                    when(p>0) student_aquire -> print -> release ->
PRINTINGMACHINE [p - 1]
                                |
                                    when(p==0) technician_aquire -> refill ->
release -> PRINTINGMACHINE[MAX_SHEETS]
                                ).
```

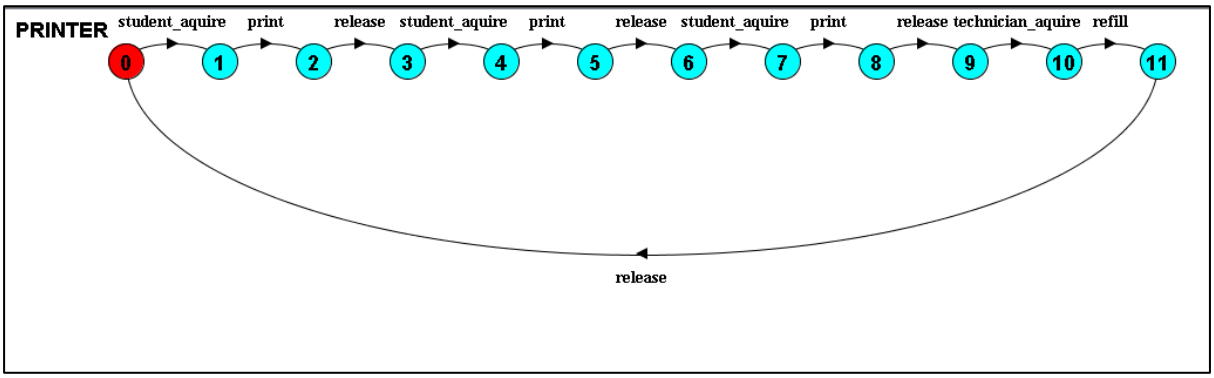
3. Actions Description

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
student_aquire	Acquisition of the printer by the student	Synchronous
technician_aquire	Acquisition of the printer by the technician	Synchronous
print	Printing the document	Synchronous
refill	Refilling the empty paper stack with papers	Synchronous
release	Releasing the lock with printer after using it	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.)

States	Represents
0	Printer has been released by the technician and is ready to be acquired by the student (initial state)
1	Printer gets acquired by a student
2	First paper gets printed
3	Student releasing the printer
4	Printer gets acquired by the student
5	Second paper gets printed
6	Student release the printer
7	Printer gets acquired by the student
8	Third paper gets printed
9	Student release the printer
10	Printer gets acquired by the technician
11	Printer gets refilled with 3 papers by the technician

6. Trace Tree for FSP Process

The trace tree for the process. Use the conventions given in the lecture notes