6SENG002W Concurrent Programming

FSP Process Composition Analysis & Design Form

Name	Thivya Thogesan
Student ID	W1698503
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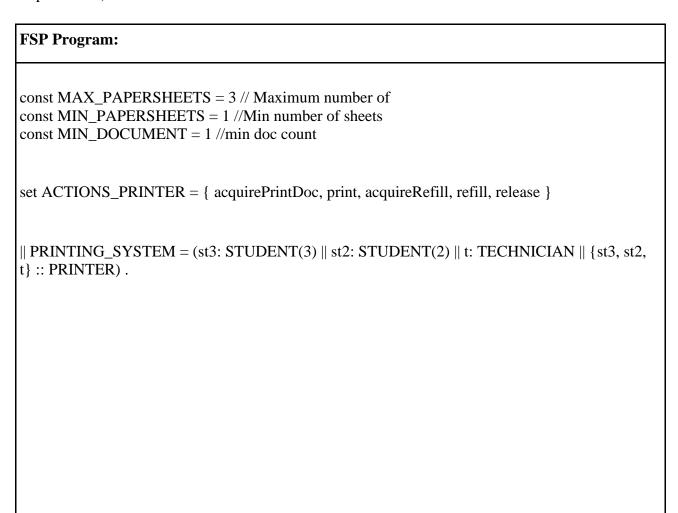
1. FSP Composition Process Attributes

Attribute	Value
Name	PRINTING_SYSTEM
Description	It models a composite process containing a printer, two students and a technician
Alphabet (Use LTSA's compressed notation, if alphabet is large.)	{{st2, st3}.{acquirePrintDoc, acquireRefill, print, refill, release}, t.{ acquirePrintDoc, acquireRefill, print, refill, release, wait}}
Sub-processes (List them.)	PRINTER, STUDENT, TECHNICIAN
Number of States	55
Deadlocks (yes/no)	NO
Deadlock Trace(s) (If applicable)	N/A – NO DEADLOCK

2. FSP "main" Program Code

6SENG002W: FSP Process Composition Form 1 [22/10/2020]

The code for the parallel composition of all of the sub-processes and the definitions of any constants, ranges & process labelling sets used. (Do not include the code for the other subprocesses.)



3. Combined Sub-processes

(Add rows as necessary.)

Process	Description
STUDENT	This sub-process represents of a student who wants to acquire the printer and print documents using it.
TECHNICIAN	This sub-process represents of a technician who wants to acquire the printer and refill the number of sheets.
PRINTER	This sub-process represents of a printer resource which provides facilities to print documents.

6SENG002W: FSP Process Composition Form 2 [22/10/2020]

4. Analysis of Combined Process Actions

- Synchronous actions are performed by at least two sub-process in the combination.
- **Blocked Synchronous** actions cannot be performed, since at least one of the subprocesses cannot preform them, because they were added to their alphabet using alphabet extension.
- **Asynchronous** actions are preformed independently by a single sub-process.

Group actions together if appropriate, for example if they include indexes, e.g. in[0], in[1], ..., in[5] as in[1..5].

(Add rows as necessary.)

Synchronous Actions	Synchronised by Sub-Processes (List)
st2.acquirePrintDoc, st3. acquirePrintDoc st2.print, st3.print	STUDENT, PRINTER
st3.release, st2.release, t.release	TECHNICIAN, STUDENT, PRINTER
t.acquireRefill, t.refill	TECHNICIAN, PRINTER

Blocked Synchronous Actions	Synchronizing sub process(List)	Blocking sub-Processes
st3.acquireRefill, st3.refill, st2.acquireRefill, st2.refill	STUDENT, PRINTER	STUDENT
t.acquirePrintDoc, t.print	TECHNICIAN, PRINTER	TECHNICIAN

Sub-Process	Asynchronous Actions (List)
STUDENT	N/A
PRINTER	N/A

6SENG002W: FSP Process Composition Form 3 [22/10/2020]

TECHNICIAN	t.wait
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5. Parallel Composition Structure Diagram : shown below

The structure diagram for the parallel composition.

