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Lab ProcessAlgebra

Part1: experimentation

Step1: Installation (you can adapt)

1. insert into ~/.bashrc the contents of:

http://homepages.laas.fr/khalil/page/index.php?n=COURS.CheminCADP

2. create a TP_TDF directory at home: **mkdir ~/TP_TDF**
3. Retrieve the LOTOS code: **http://homepages.laas.fr/khalil/page/index.php?n=CHOIX.Lot**

Step2: Compilation

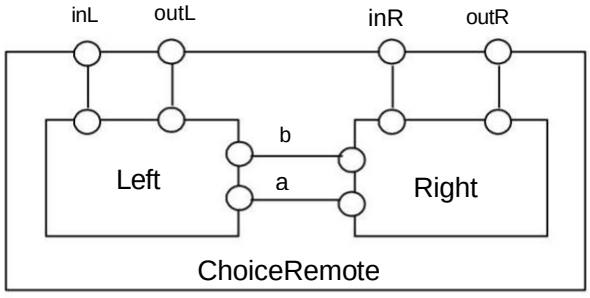
1. go to ~/ TP_TDF: **cd ~/TP_TDF**
2. compile CHOIX.lot: **caesar.adt CHOIX.lot**
3. to generate the STE: **caesar CHOIX.lot**
4. to reduce the STE: **bcg_min -branching CHOIX.bcg**
5. to visualize the STE in bcg format: **bcg_edit CHOICE.bcg** *(with the right button on each arc choose "symmetrical curve",* manual under http://www.inrialpes.fr/vasy/cadp/man/bcg_edit.html)

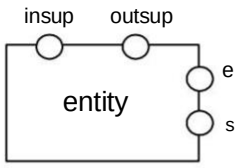
Step3: Analysis of the result

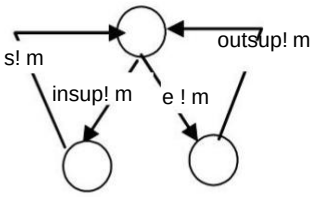
The result is a Labeled Transitions System (LTS) reduced according to the observational equivalence found in the CHOICE.bcg file (parameter that you change from one question to another). From one question to another, keep a copy of the CHOIX.lot and CHOIX.bcg files.

Part2: development

We consider the remote choice problem described by the following figure.



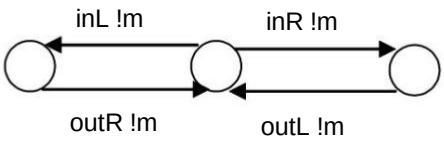




1. Model in Lotos the entity process whose behavior is modeled on the right of the figure. Generate the associated transition system, and reduce it by observational equivalence.
2. Describe Left and Right as two instances of the entity process that communicate by Rendezvous via doors a and b. Generate the transition system associated with “ChoixDistant”, reduce it by observational equivalence. We notice two problems with the service provided by this system.

(pb1) The capacity is 2: the sequence inL! m; inL! m is present in the service provided; (pb2) There is risk of deadlock.

3. introduce a protocol level acknowledgment to reduce the capacity to one.
4. Introduce a circulating privilege mechanism to solve the deadlock problem. Check that your model provides the service shown in Figure 2.



5. Replace appointment communication with a FIFO communication medium by defining a Lotos process yourself which models it or by using the one provided to you in progress. Increase the medium capacity and verify that the service is unchanged.

Note: The tools used are **1. casear.adt :** Abstract Types -> Caesar Representation, **2. Caesar :** Lotos -> Labeled Transition Systems (LTS) **3. Bcg_min :** LTS -> LTS (reduced according to an observable equivalence,…). The online manual is under http:// www.inrialpes.fr/vasy/cadp..