

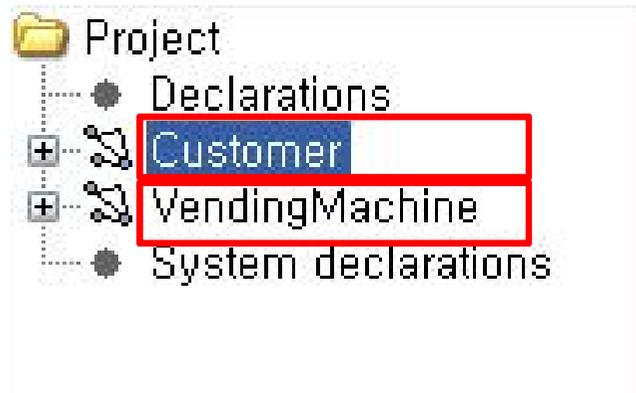
UPPAAL을 이용한 커피자판기 설계

Team 2(이근수, 김준영)

Editor를 이용한 설계(1)

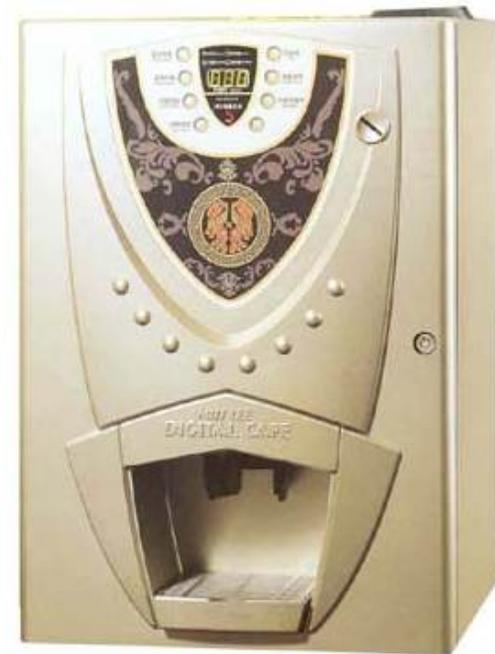
▶ 구성

- ▶ 입력을 발생시키는 “Customer”
- ▶ 입력에 의해 행동을 수행하는 “VendingMachine”



Editor를 이용한 설계(2)

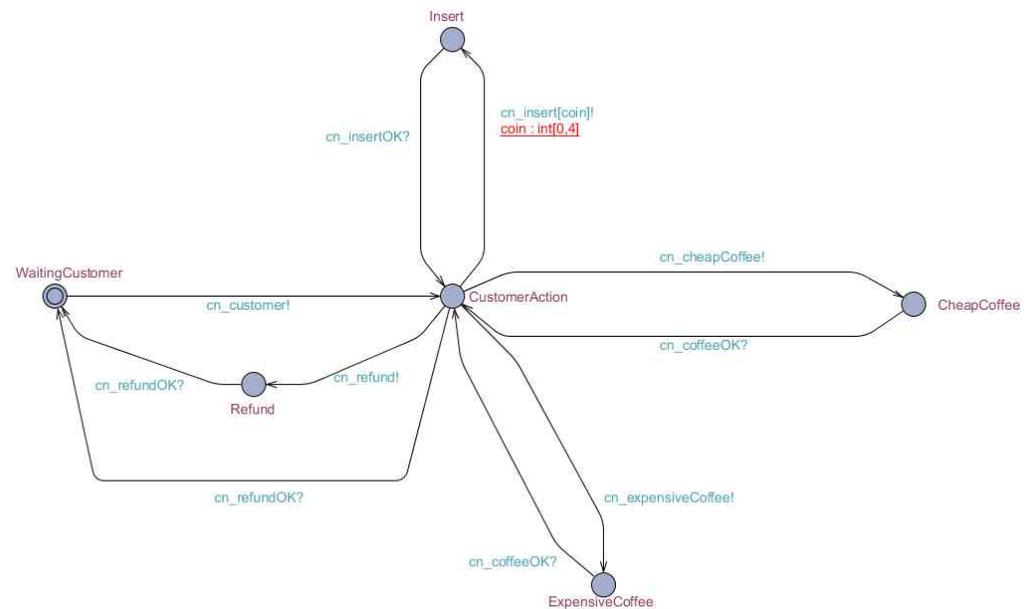
- ▶ 가상의 자판기 특징
 - ▶ “10, 50, 100, 500, 1000원”권 투입 가능
 - ▶ 10,000원 이상 투입 불가
 - ▶ 5초이상 입력이 없으면 잔돈 반환
 - ▶ 두 종류의 음료 제공
 - ▶ 일반 커피(150원)
 - ▶ 고급 커피(300원)
 - ▶ 반환 버튼 제공



Editor를 이용한 설계(3)

▶ Customer의 Location 정의

- ▶ 자판기 사용자가 없는 “WaitingCustomer”
- ▶ 자판기 사용자가 나타나 자판기를 사용하는 과정 “CustomerAction”
- ▶ 커피를 선택하는
 - ▶ “CheapCoffee”
 - ▶ “ExpensiveCoffee”
- ▶ 돈을 투입하는 “Insert”
- ▶ 반환 버튼을 누르는 “Refund”

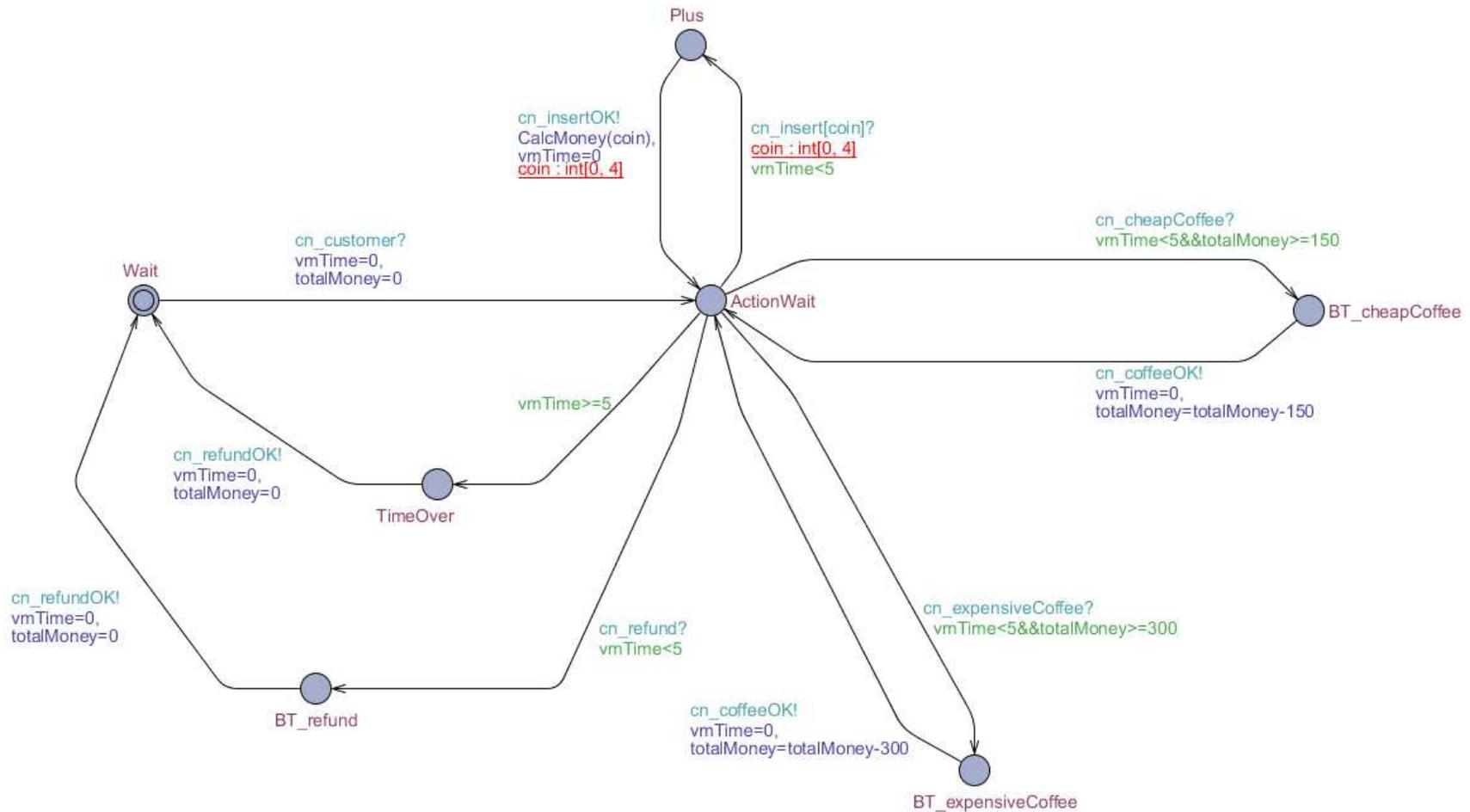


Editor를 이용한 설계 (3)

- ▶ VendingMachine의 Location 정의
 - ▶ 사용자 없이 대기하는 “Wait”
 - ▶ 사용자의 입력을 기다리는 “ActionWait”
 - ▶ 돈이 투입되는 “Plus”
 - ▶ 커피가 선택되는
 - ▶ “BT_cheapCoffee”
 - ▶ “BT_expensiveCoffee”
 - ▶ 사용자가 반환버튼을 누른
“BT-refund”
 - ▶ 5초 이상 입력이 없는
“TimeOver”



Editor를 이용한 설계(3)



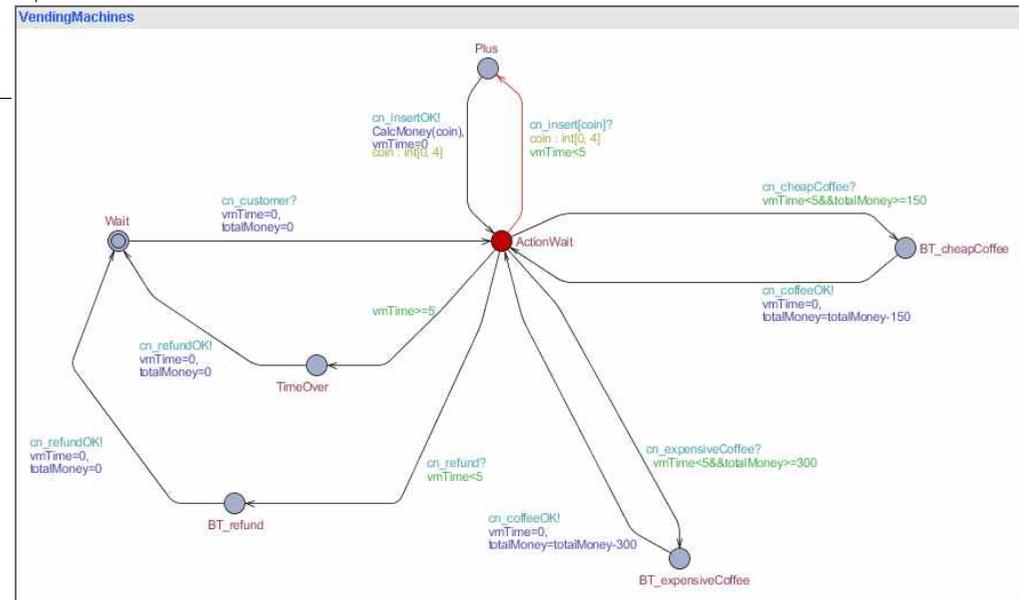
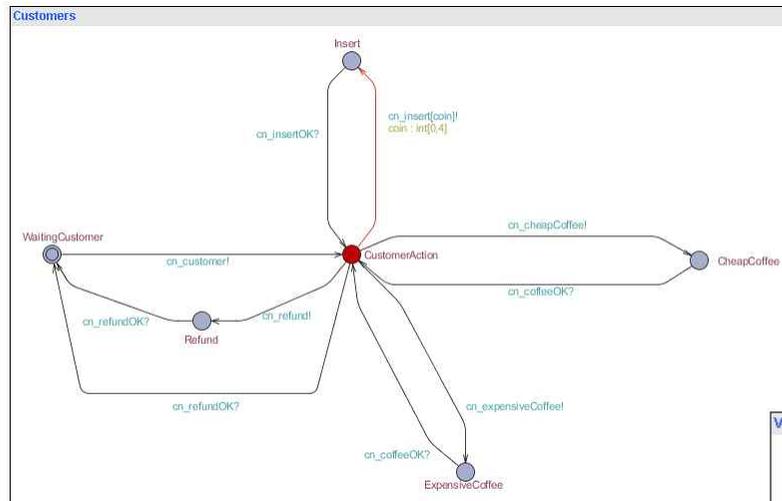
Simulator를 이용한 확인(1)

The screenshot displays a simulator interface with three main components:

- Enabled Transitions:** A list of transitions for the VendingMachines process, including `cn_insert[coin]: Customers --> VendingMac`, `cn_expensiveCoffee: Customers --> Vending`, `cn_cheapCoffee: Customers --> VendingMa`, and `cn_refund: Customers --> VendingMachines`. Below the list are `Next` and `Reset` buttons.
- Simulation Variables:** A central area showing `VendingMachines.totalMoney = 1610` and `VendingMachines.vmTime in [0,5)`.
- Simulation Trace:** A log of simulation events, including `cn_insert[coin]: Customers --> VendingMac (Insert, Plus)`, `cn_insertOK: VendingMachines --> Custome (CustomerAction, ActionWait)`, `cn_refund: Customers --> VendingMachines (Refund, BT_refund)`, and `cn_refundOK: VendingMachines --> Custom (WaitingCustomer, Wait)`. The last line is highlighted in red.



Simulator를 이용한 확인(2)



Verifier를 이용한 검증(1)

Overview

E<> Customers.CheapCoffee and VendingMachines.BT_cheapCoffee	●
A<> VendingMachines.totalMoney < 10000	●
E<> VendingMachines.ActionWait	●

Status

Established direct connection to local server,
(Academic) UPPAAL version 4.0.10 (rev. 4417), September 2009 -- server,
Disconnected,
Established direct connection to local server,
(Academic) UPPAAL version 4.0.10 (rev. 4417), September 2009 -- server,
E<> Customers.CheapCoffee and VendingMachines.BT_cheapCoffee
Property is satisfied,
A<> VendingMachines.totalMoney < 10000
Property is satisfied,
E<> VendingMachines.ActionWait
Property is satisfied,

