Part 1: Constructing a State Machine

Define a state machine for a vending machine.

- The vending machine has an unlimited number of sodas that it sells for 75 cents apiece.
- The user can deposit quarters in the machine.
- If the user presses the `cancel` button, all the coins she's put in so far are returned.
- If the user presses the `dispense` button,
  - If she had not deposited at least 75 cents, she gets no soda and no change.
  - If she had deposited 75 cents or more, she gets a soda and any amount over 75 cents that she has deposited.

More concretely,

- The input for the machine is one of:
  - 'quarter' (25 cents) indicates that a coin has been deposited
  - 'cancel' indicates that the user wants her money back
  - 'dispense' indicates that the user wants a soda
- The output of the machine is:

  (change, soda)

where

- change is an integer that indicates (in cents) the amount of change (possibly 0) that is returned
- soda is a boolean that indicates whether or not the machine will dispense a soda

For example:

Vending().transduce(['dispense', 'quarter', 'quarter', 'quarter', 'quarter', 'dispense', 'quarter', 'cancel', 'dispense'])

would return:

[(0, False), (0, False), (0, False), (0, False), (0, False), (25, True), (0, False), (25, False), (0, False)]
`class Vending(sm.SM):
    startState = 0
    def getNextValues(self, state, inp):
        if inp == 'quarter':
            return (state+1, (0, False))
        if inp == 'cancel':
            return (0, (25*state, False))
        if inp == 'dispense':
            if state<3:
                return (state, (0, False))
            return (0, (25*(state-3), True))

This is the answer we wrote:

`class Vending(sm.SM):
    startState = 0
    def getNextValues(self, state, inp):
        if inp == 'cancel':
            return (0, (state, False))
        elif inp == 'dispense':
            if state >= 75:
                return (0, (state - 75, True))
            else:
                return (state, (0, False))
        else: # 'quarter'
            return (state + 25, (0, False))

Part 2: Enable Submit

Current time is: 3/1/2011, 9:10pm
Click Submit before: 2/17, 9:50am
The Check button will update the current time.

Enter Done below

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and click Submit.

If this problem is submitted past the due time, this subproblem will be marked incorrect.
This is a multi-part problem, each part has its own Save and Check buttons but there is ONLY ONE Submit button for the WHOLE problem. Finish working on all the parts before you click on Submit.

Get Answers

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