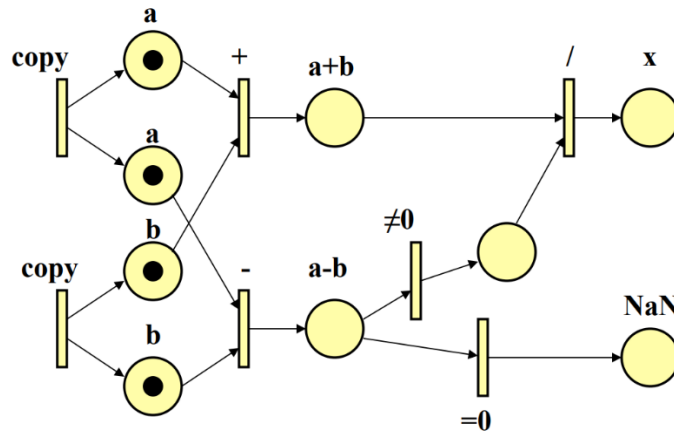


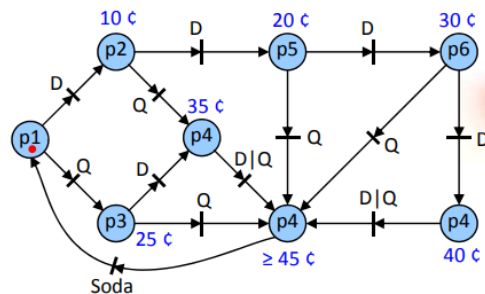
Question #

1. Write down the equation modeled by following petrinet.



Answer: $x = \frac{a+b}{a-b}$

2. Following Petrinet models a simple soda vending machine where customer pays in Dimes (10c) or Quarters (25c). A soda is worth 45c. What happens if a customer overpays?



Answer: The customer gets the soda but the change is not paid back to the customer

Question # 1: Following schema defines the state space of a simple counter with a current value and a limit:

<i>Counter</i>
$value, limit : \mathbb{N}$
$value \leq limit$

Here is a schema describing an initial state for the counter

<i>InitCounter</i>
<i>Counter</i>
$value = 0$
$limit = 100$

1. Write down an increment operation schema which increments the value of the counter by one.

<i>Inc</i>
<i>Counter</i>
<i>Counter'</i>
$value' = value + 1$
$limit' = limit$

2. Write an operation schema which adds its input to the value of the counter, and outputs the new value.

<i>Add</i>
<i>Counter</i>
<i>Counter'</i>
$jump? : \mathbb{N}$
$new_value! : \mathbb{N}$
$value' = value + jump?$
$limit' = limit$
$new_value! = value'$

3. Write an operation schema which inputs a number and adds its square to the value of the counter, producing the new value as output.

$\Delta Counter$
$x? : \mathbb{N}$
$new_value! : \mathbb{N}$
$value' = value + x? * x?$
$limit' = limit$
$new_value! = value'$

4. Write down a Schema to print a limit_reached message when the counter reaches its limit.

5. Draw a Petrinet for the schema operation written by you in part (3).