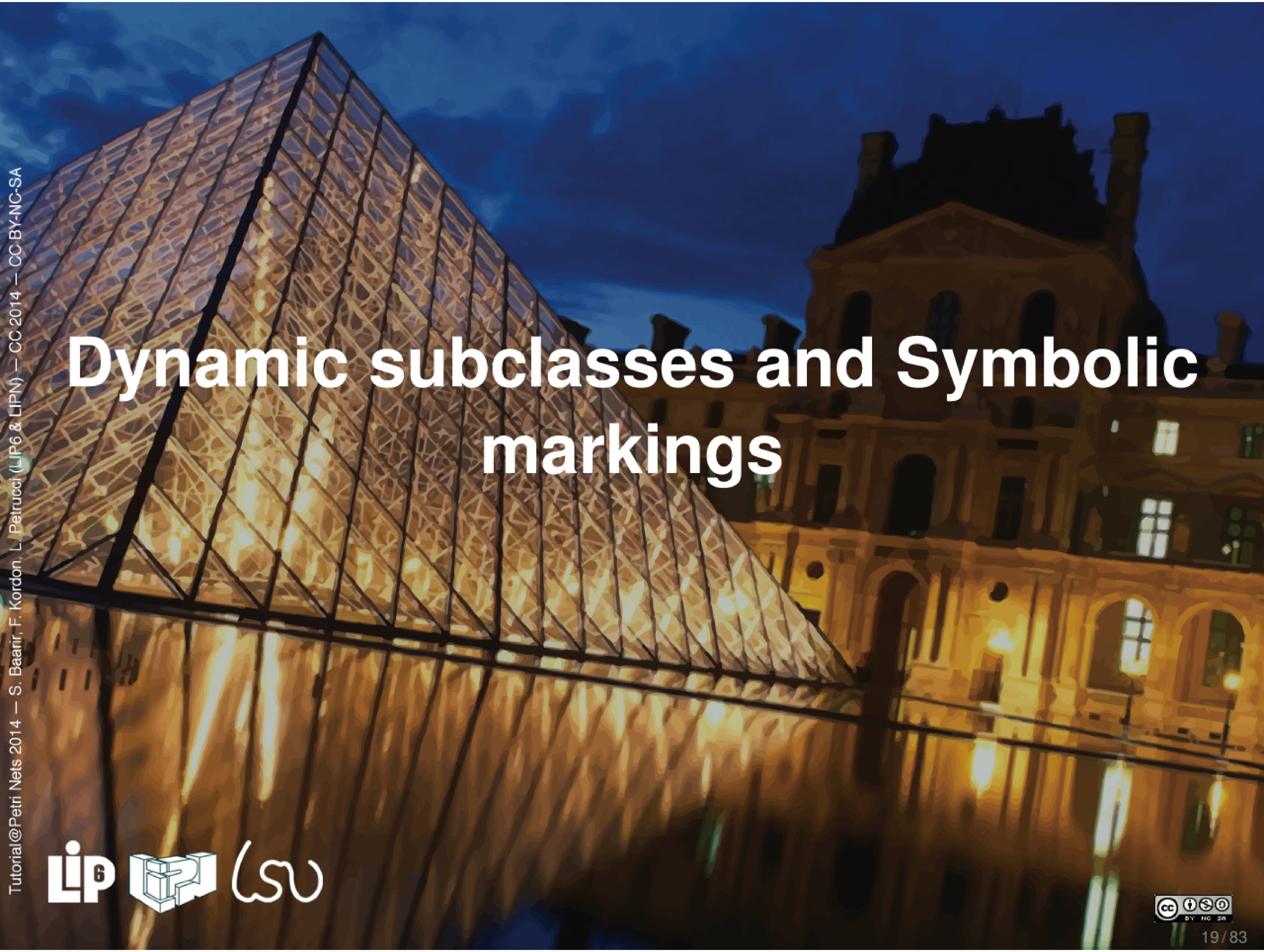
Dynamic subclasses and Symbolic markings



Introduction

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This is realized throw the notions of:

- **Dynamic subclasses.**
- **Symbolic markings.**

Dynamic subclasses for unordered class

- We group in a set (dynamic subclass) the objects of C_i that have the same marking.

- Example:
  - $M = Idle(c_1 + c_2) + Wait(c_3) + Res$

$$\Rightarrow Idle(x + y) + Wait(z) + Res$$
$$M(x) = M(y) \rightarrow Z^1, \mid Z^1 \mid = 2$$
$$M(z) \neq M(x) \text{ et } M(z) \neq M(y) \rightarrow Z^2, \mid Z^2 \mid = 1$$

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$$\Rightarrow \; Idle(Z^1) + Wait(Z^2) + Res$$
$$|Z^1| = 2, |Z^2| = 1$$
(Symbolic Marking)

Dynamic subclasses for ordered classes (1/2)

- A dynamic subclass represents objects that have the same marking and
  - are consecutive in the class enumeration order, and
  - the successor of the last element represented by Z^i is represented by Z^{i+1}.

- Example:
  - $Think(c_2 + c_4 + c_5) + Eat(c_1 + c_3) + F(c_5)$
    $\Rightarrow$ A dynamic subclass by object.
  - $Think(Z^2 + Z^4 + Z^5) + Eat(Z^1 + Z^3) + F(Z^5)$, $|Z^i| = 1$
  - $Think(c_1 + c_3 + c_5) + Eat(c_2 + c_4) + F(c_1)$
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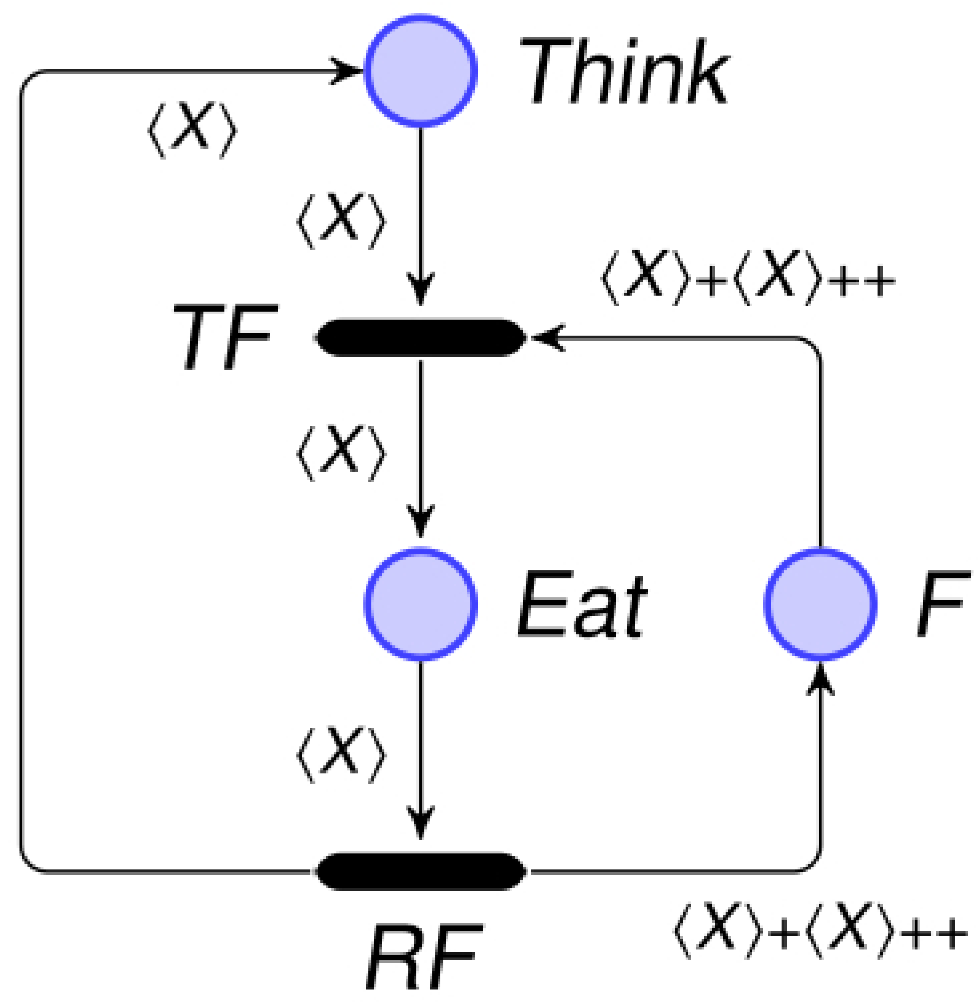
$C = \{c_1, c_2, c_3, c_4, c_5\}$



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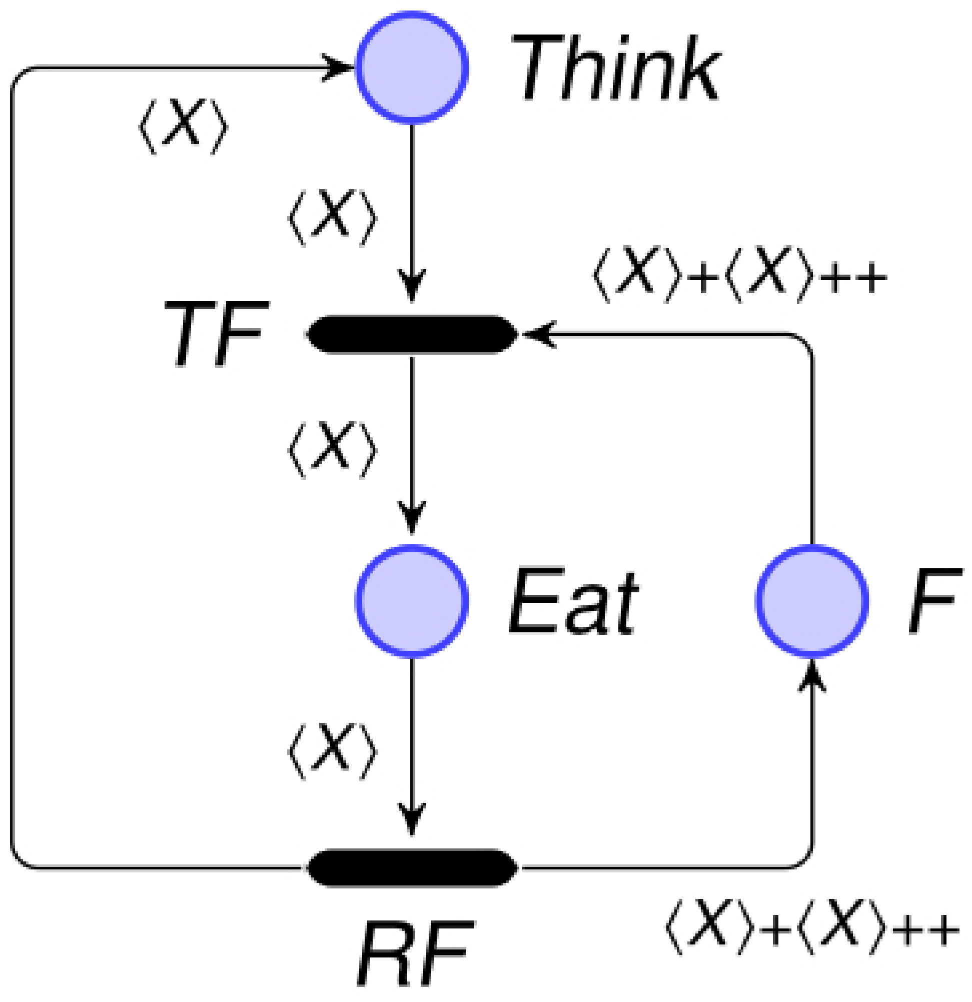

Think(Z) + F(Z)

| Z | = 5

Think(c_1+ c_2+ c_3+ c_4+c_5)
+ F(c_1+ c_2+ c_3+ c_4+c_5)

↓ (TF, c_1)

Think($\mathbf{c_2}$+ $\mathbf{c_3}$+ $\mathbf{c_4}$+$\mathbf{c_5}$) + F($\mathbf{c_3}$+ $\mathbf{c_4}$+$\mathbf{c_5}$) + Eat($\mathbf{c_1}$)

Think(Z^1+Z^3) + F(Z^1)+ Eat(Z^2)

| Z^1 | = 3, | Z^2 | = | Z^3 | = 1

Think(c_3+ c_4+ c_5+c_1) + F(c_4+ c_5+c_1) + Eat(c_2)

Think(c_4+ c_5+ c_1+c_2) + F(c_5+ c_1+c_2) + Eat(c_3)

Think(c_5+ c_1+ c_2+c_3) + F(c_1+ c_2+c_3) + Eat(c_4)

Think(c_1+ c_2+ c_3+c_4) + F(c_2+ c_3+c_4) + Eat(c_5)

Conclusion

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To construct directly a quotient graph that represents the ordinary reachability graph, we need a way to perform a firing rule, but applied directly to the symbolic markings (next sequence).