

Symbolic Firing Rule



Introduction

We know:

- how to represent, in symbolic and unique way, the marking classes.

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The definition of a [symbolic firing rule](#) that applies directly on symbolic representations, consists the second and finale stage to obtain a [quotient graph](#).

Symbolic Firing rule

- Before firing, we decompose the dynamic subclasses to isolate the objects that are used to instantiate the colour functions.

- Example:

$$\begin{array}{ccc} \text{Idle}(Z) + \text{Res} & \Rightarrow & \text{Idle}(Z^1 + Z^{1,0}) + \text{Res} \\ |Z| = 3 & & |Z^1| = 2, |Z^{1,0}| = 1 \end{array}$$

$Z^{1,0}$ contains the chosen object to instantiate X , Z^1 those that are not participating to the firing.

- We then apply the classical firing rule.
- After the firing, we must group the resulting subclasses...

Example

$$\text{Think}(Z^1+Z^3) + F(Z^1) + \text{Eat}(Z^2)$$
$$|Z^1| = 3, |Z^2| = |Z^3| = 1$$

(PF, Z^2)

$$\text{Think}(Z) + F(Z)$$
$$|Z| = 5$$

$$\text{Think}(Z^{1,0} + Z^{1,1} + Z^{1,2} + Z^3) + F(Z^{1,0} + Z^{1,1} + Z^{1,2}) + \text{Eat}(Z^2)$$
$$|Z^i| = 1$$

(TF, $Z^{1,0}$)

$$\text{Think}(Z^{1,1} + Z^{1,2} + Z^3) + F(Z^{1,2}) + \text{Eat}(Z^{1,0} + Z^2)$$
$$\text{Think}(Z^2 + Z^3 + Z^5) + F(Z^3) + \text{Eat}(Z^1 + Z^4)$$
$$|Z^i| = 1$$

(TF, $Z^{1,1}$)

$$\text{Think}(Z^{1,0} + Z^{1,2} + Z^3) + F(Z^{1,0}) + \text{Eat}(Z^{1,1} + Z^2)$$
$$\text{Think}(Z^1 + Z^3 + Z^5) + F(Z^1) + \text{Eat}(Z^2 + Z^4)$$
$$|Z^i| = 1$$

Conclusion

At this stage, we know:

- how to represent, in symbolic and unique way, the marking classes,
- how to fire from a symbolic marking, a symbolic instance, to obtain the symbolic successor.

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We are ready to derive an algorithm to construct the symbolic reachability graph (next sequence).