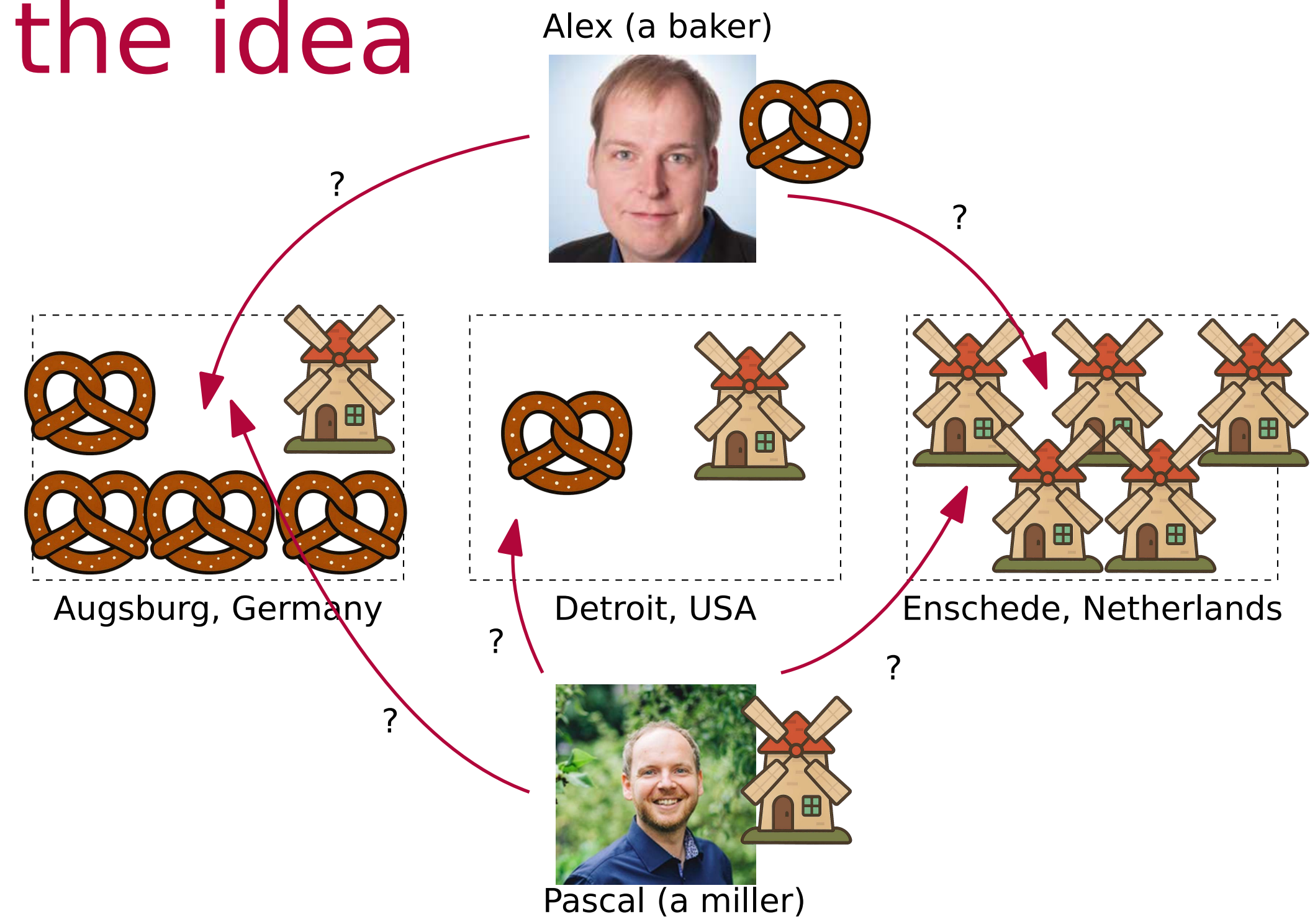


The Bakers and Millers Game with Restricted Locations

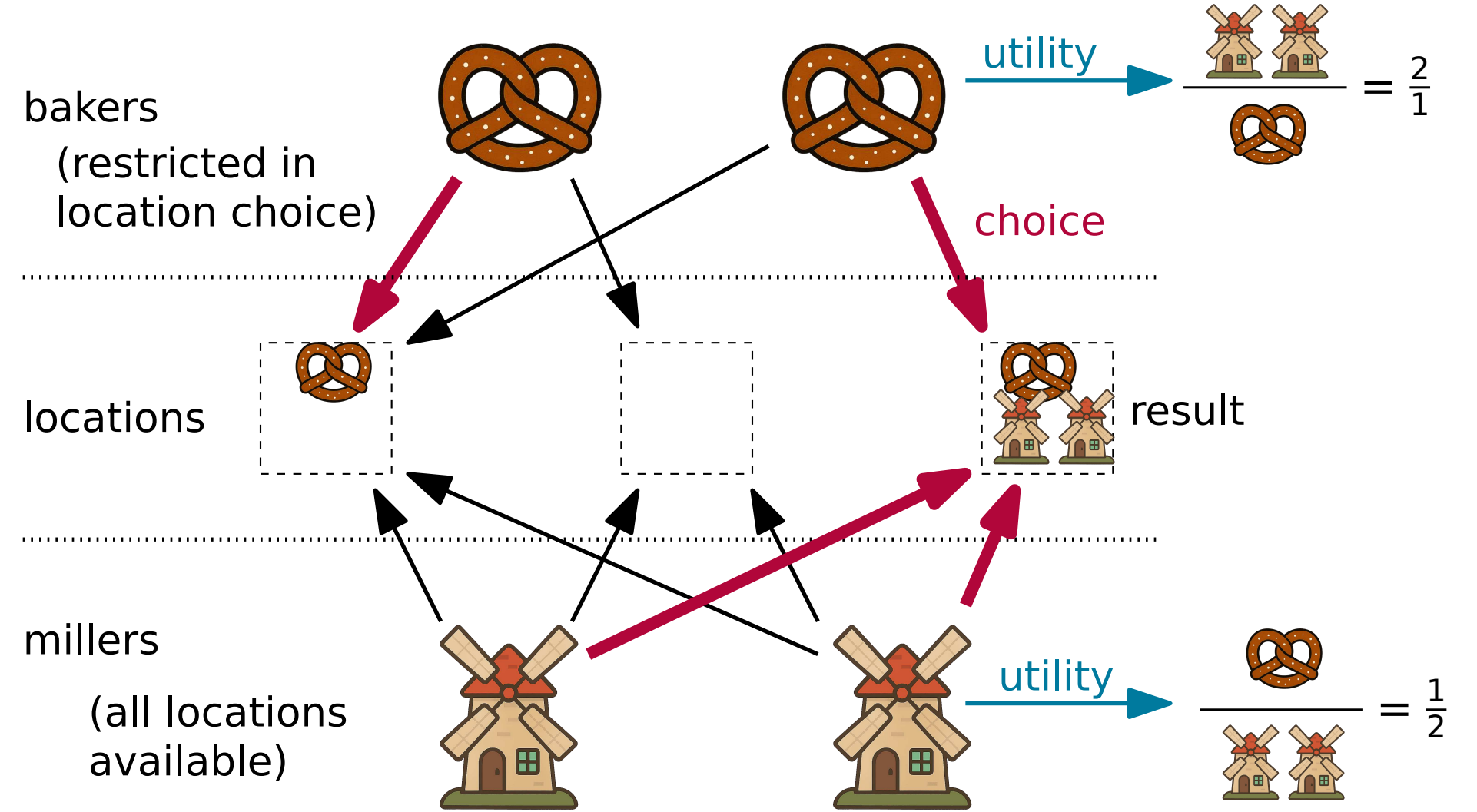
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the idea



the model

related to Fractional Hedonic Games [Aziz, Brandt, Harrenstein, AAMAS 2014]



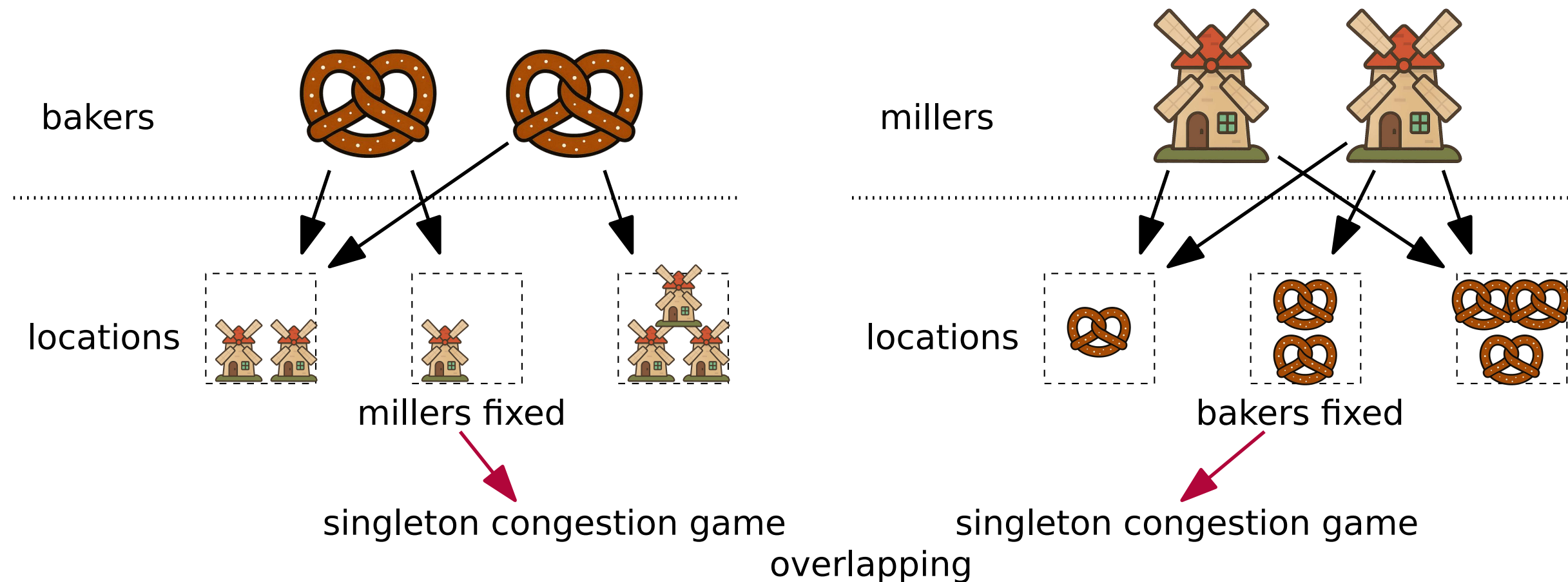
which location to open a mill/bakery for:

1. minimizing competition?
2. maximizing trading partners?

applicable for

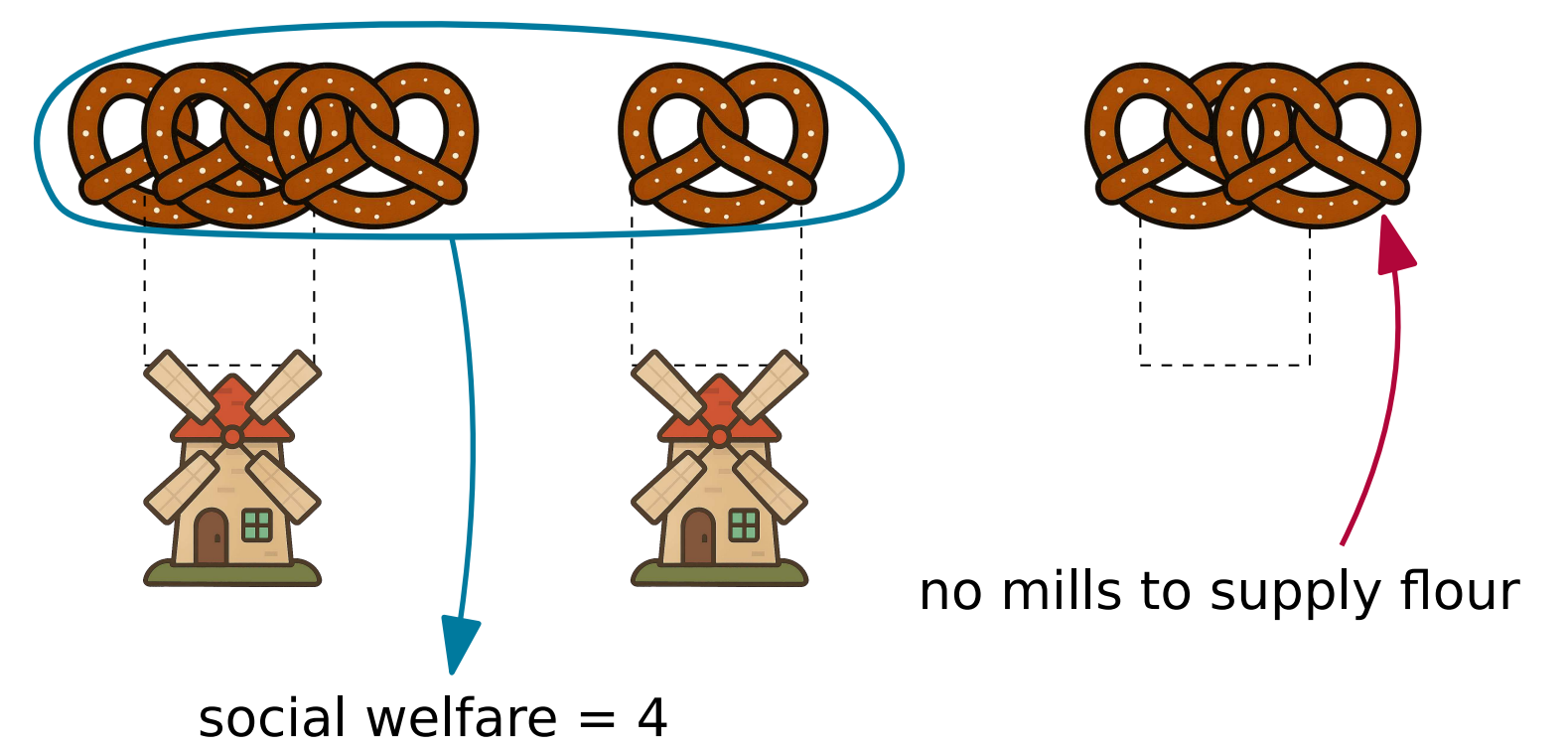
bakers	millers
1. workforce	companies
2. customer	supplier
3. shoppers	supermarkets
...	...

overlapping congestion games



social welfare

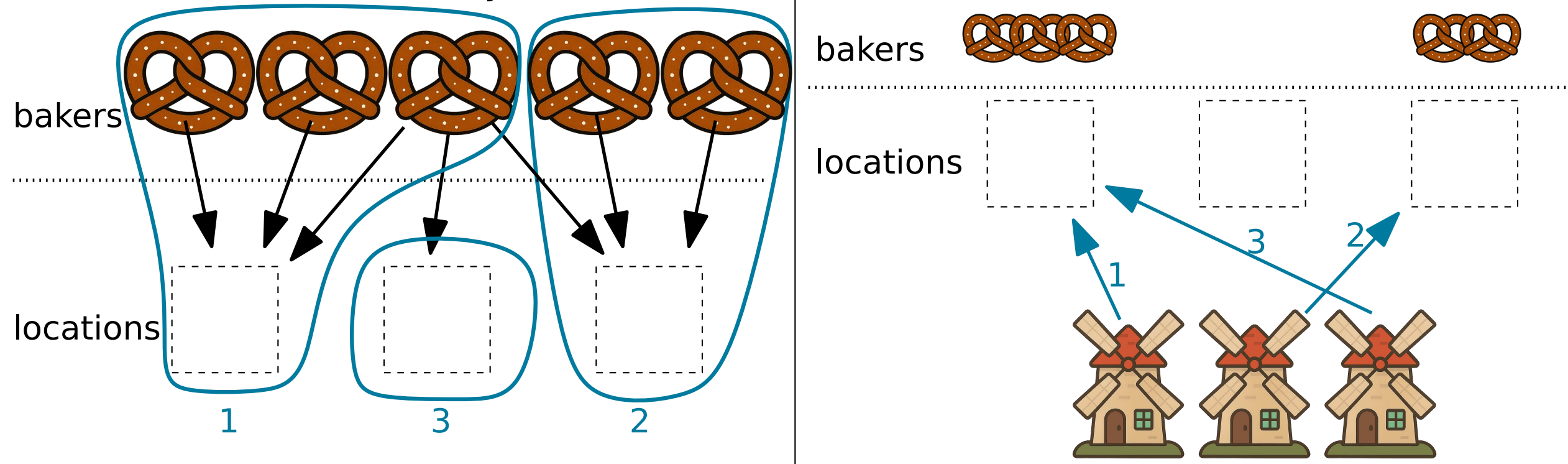
social welfare = number of covered bakers



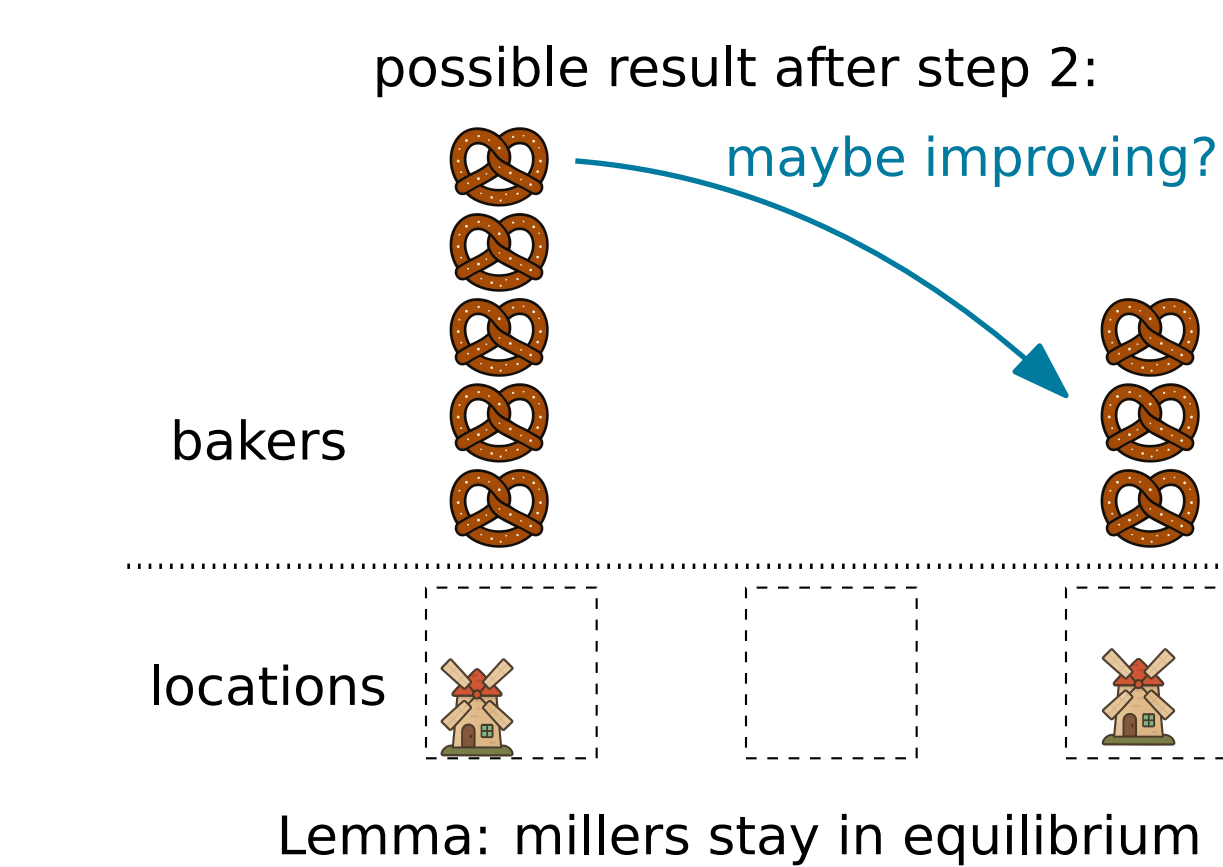
main result: NE algorithm

compute a Nash equilibrium in polytime

1. find best location and assign all bakers (iteratively)
2. insert millers in best-response locations



3. bakers → potential minimum



arxiv:



$$\text{price of stability} = \left(1 + \frac{\min(\#locations, \#millers) - 1}{\#millers}\right) < 2$$

$$\text{price of anarchy} = \#bakers$$

approximation factor of our NE algorithm

$$\left(1 + \frac{\min(\#locations, \#millers) - 1}{\#millers}\right) \frac{e}{e-1}$$

$$< 2 \left(\frac{e}{e-1}\right)$$

Nash equilibrium inefficiency

inefficient location selection in step 1

open questions

- what about weighted bakers/millers?
- what if both sides are restricted?

Apply location restrictions to other hedonic games!