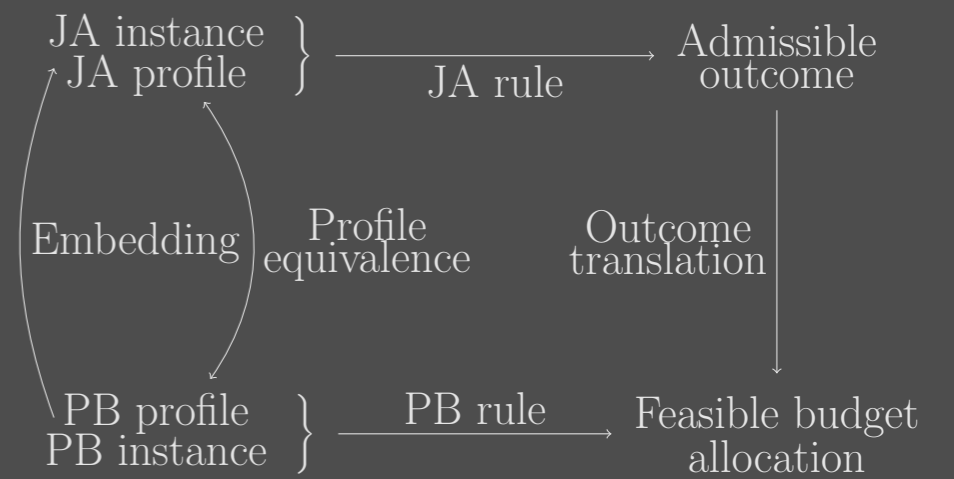


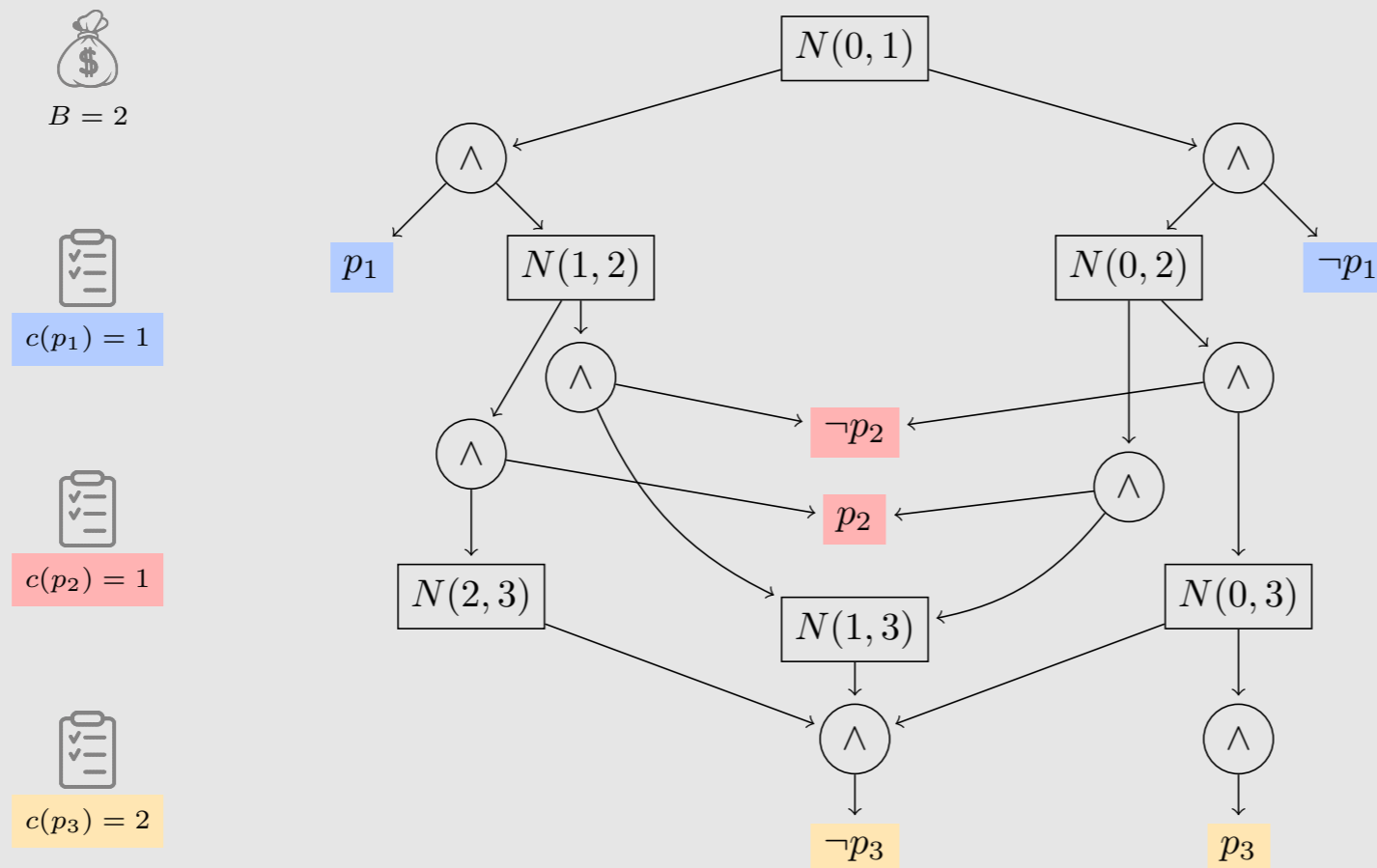
# Designing Participatory Budgeting Mechanisms Grounded in Judgment Aggregation

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Taking a top to bottom approach: efficiently restricting judgment aggregation to participatory budgeting.



## Efficient Embeddings from Participatory Budgeting to Judgment Aggregation with DNNF Circuits



Efficient computations for all **additive rules** when the integrity constraint is a **DNNF circuit**.

Embedding returns a DNNF circuit of size **pseudo-polynomial** in the size of the PB instance.

Similar constructions also work for:

- Dependencies between projects,
- Quotas on categories of projects.

## Performance of Judgment Aggregation Rules for Participatory Budgeting: Axiomatic Analysis

Special focus on **exhaustiveness**:

- Encoding it in the **integrity constraint**: only works for one resource,
- Using **asymmetric rules**: changing the semantic of negation in judgment aggregation.

Judgment aggregation rules behave **similarly** to participatory budgeting rules with respect to other axioms.

	Kemeny rule		Slater rule		Leximax rule	
	usual	asymmetric	usual	asymmetric	usual	asymmetric
Exhaustiveness	✗	✓	✗	✓	✗	✓
Limit Monotonicity	✗	✗	✗	✗	✗	✗
Discount Monotonicity	✓	✓	✓	✓	✓	✓
Splitting Monotonicity	✗	✓	✗	✓	✗	✓
Merging Monotonicity	✗	✗	✗	✗	✗	✗