Two-Sided Random Matching Markets:
Ex-Ante Equivalence of the Deferred Acceptance Procedures

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Agents order their neighbours uniformly at random.
You are an evil decision maker

You need to chose the procedure:
- **MPDA**: Men Proposing Deferred Acceptance
- **WPDA**: Women Proposing Deferred Acceptance

You really like this matching:

\[
\mu = m_1 w_1, m_2 w_2, m_3 w_3, m_4 w_4, m_5 w_4
\]

What should you do to maximize the probability of choosing \( \mu \)?
Output distribution of **MPDA**.

\[ P[\text{MPDA outputs } \mu] = \frac{299}{5184} \]

Output distribution of **WPDA**.

\[ P[\text{WPDA outputs } \mu] = \frac{299}{5184} \]
Theorem. “Ex-ante equivalence”

MPDA and WPDA have the same output distribution.

If you don’t know the preferences, you cannot “manipulate”...

In the talk/paper:
1. Proof of the Theorem.
2. Non-uniform distributions.

In the proof...

Lattice of stable matchings.

Probability of stability.

\[
\int_0^1 \cdots \int_0^1 \, dx_1 \cdot dx_2 \cdot dx_3 \cdot dx_4 \cdot dy_1 \cdot dy_2 \cdot dy_3 \cdot dy_4 \\
\quad \cdot (1 - x_1 y_2) \cdot (1 - x_2 y_1) \\
\quad \cdot (1 - x_2 y_3) \cdot (1 - x_3 y_2) \\
\quad \cdot (1 - x_3 y_4) \cdot (1 - x_4 y_3) \\
\quad \cdot (1 - y_2) \cdot (1 - y_4) \\
= \frac{1391}{20736}
\]