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### Game Theoretic Analysis of the Fair Division Mechanism “Spliddit”

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# GAME THEORETIC ANALYSIS OF THE FAIR DIVISION MECHANISM “SPLIDDIT”

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In the fair division literature, the problem of assigning rooms and dividing rent in an apartment has been well studied. In recent years, several solutions have been developed, all of which employ envy-freeness as a criterion of fairness. These room/rent allocation mechanisms are able to yield remarkably desirable outcomes. However, any such mechanism that achieves envy-free allocations necessarily provides agents with incentives to misreport their true preferences. In this paper, the author studies strategic behavior when preferences are private information under the most popular of these mechanisms: the online rent division program Spliddit. Best strategies are computed for a class of special cases of the game induced by Spliddit involving two players. A parameterized probability distribution is used to develop a solution for computing best strategies for a broad variety of given preference distributions. These solutions constitute Bayesian Nash Equilibria of the game induced by the mechanism. A conjecture for how these results generalize to larger numbers of rooms and players is developed.