College admission problem with clear-in ranks: Extended Abstract

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Over 200000 prospective students apply to Australian universities via one of the several centralised admission centres each year. This paper studies a particular aspect of that centralised system: an importance of a “clear-in rank”. Clear-in rank is one of the most important statistics reported in Australia about the offers made to the students; it is a score which guarantees the admission to a particular course in a university. This score is viewed as a signal of a quality of a course and courses are interested in increasing it. Hence, we model a course as deriving utility from the number of admitted students and from the higher cut-off score. Clearly, these numbers are inversely related.

Following the timing of the Australian admission system, we model the whole admission process as the following dynamic game: (1) the students report their preferences (contrary to Australian practice, we do not restrict the length of the preference list); (2) courses, upon learning who apply to them, determine their cut-off value (and quota); (3) the allocation is determined by a standard Gale-Shapley deferred acceptance algorithm (DAA). We also assume that no student whom the offer has been made can be forced to enroll to a course that made the offer; a student always has an option of staying outside of the higher education system. Assuming that a student-optimal version of DAA is used, we show that it is a weakly dominant strategy for students to list all courses in their preferences, even these that the student has no intention to enroll.

The reason for that is that listing more courses (weakly) increases the number of students a course is willing to admit. Although such an increase does not benefit directly a student who misreport, it may free up places in a course that is acceptable for such a student, making a student better off. At the same time, such strategy cannot make a student worse off. Thus, in equilibrium, all students list all courses in their preferences and colleges disregard this information. Such behaviour lead to inefficiencies resulting from the fact that offers are made to students who do not plan to matriculate.

To contrast these findings with a standard one-shot admission game, where courses and students submit their preferences simultaneously, hence taking away the ability of the courses to adjust their admission standards in response to student preferences, we note that it is a dominant strategy for a student to submit true preferences to the mechanism. Moreover, if a college-optimal version of DAA is used, students may find it worthwhile to truncate their preferences and it is never in their interest to list unacceptable courses as acceptable. In our model, the opposite may be true: extending preferences beyond acceptable courses may be beneficial.