

Two-Sided Markets (2019)

Prepared by:

Joseph Malkevitch
Department of Mathematics and Computer Studies
York College (CUNY)
Jamaica, New York

email:

malkevitch@york.cuny.edu

web page:

<http://www.york.cuny.edu/~malk/>

Two-sided markets:

Eight hospitals (upper table) and 8 medical students (second table) have ranked each other as indicated in the tables below. For example, Hospital 5 (names in first column) has ranked Medical Student 2, second, while Medical Student 4 has ranked Hospital 2 fourth.

Hospital rank medical students (Column 1, hospital names)

1	5	7	1	2	6	8	4	3
2	2	3	7	5	4	1	8	6
3	8	5	1	4	6	2	3	7
4	3	2	7	4	1	6	8	5
5	7	2	5	1	3	6	8	4
6	1	6	7	5	8	4	2	3
7	2	5	7	6	3	4	8	1
8	3	8	4	5	7	2	6	1

Students rank hospitals (Column 1, student names)

1	5	3	7	6	1	2	8	4
2	8	6	3	5	7	2	1	4
3	1	5	6	2	4	8	7	3
4	8	7	3	2	4	1	5	6
5	6	4	7	3	8	1	2	5
6	2	8	5	3	4	6	7	1
7	7	5	2	1	8	6	4	3
8	7	4	1	5	2	3	6	8

What is a reasonable way to pair the medical students to the hospitals?

In the United States a system based on the ideas developed for solving this problem by the mathematicians David Gale and Lloyd Shapley are currently used to match medical school students needing a hospital to do their residency with hospitals needing medical students for residency positions. Alvin Roth, who has a doctorate degree in Operations Research helped with others in designing the system currently in use. Roth shared the Nobel Memorial Prize in Economics for his work here. Similar ideas are also being used to develop school choice systems for placing students in schools.