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Canadian Resident Matching Service

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Operations

The Match Algorithm

The following examples illustrate how the matching algorithm works for Applicants and for **Programs.**

Applicants' Rank Order Lists

Eight applicants are applying to four programs. After considering the relative desirability of each program, the applicants submit the following rank order lists to CaRMS.

Anderson	Beaudry	Chen	Davis	Eastman	Feldman	Garcia	Hassan
1. City	1. City	1. City	1. Mercy	1. City	1. City	1. City	1. State
	2. Mercy	2. Mercy	2. City	2. Mercy	2. General	2. Mercy	2. City
			3. General	3. State	3. Mercy	3. State	3. Mercy
			4. State	4. General	4. State	4. General	4. General

Applicant Anderson makes only a single choice, City, because he is under the impression from remarks made by the program director that he would be ranked very highly, and he had in turn assured the director that he would rank City number one. It is acceptable for programs to express a high level of interest in applicants to recruit them into their program and for applicants to say that they prefer one program over others. **Such expressions, however, should not be considered as commitments.**

Applicant Beaudry ranks only the two programs that were desired by every applicant - Mercy and City. As the recipient of a special award in his third year, he feels that he is a most desirable applicant. However, he has not been assured of a match with either of these programs. **Applicants should consider ranking all programs that they are willing to attend to reduce the likelihood of not matching.**

Applicant Chen ranks City, which she prefers, and Mercy. Standing first in her class in her third year, she knows that she is a desirable applicant and she has been assured by the program director at Mercy that she will be ranked first. **Even though she has been assured of being ranked high at Mercy, she prefers City and knows she does not risk her offer at Mercy even if she ranks Mercy further down her list**. She is using the Match to her maximum advantage.

Applicant Feldman would be very pleased to be at State, where she had a very good clerkship, and feels that they will rank her high on their list. Although she does not think she has much of a chance, she prefers City, General, or Mercy so she ranks them higher and ranks State fourth. **She is using the Match to maximum advantage.**

Applicant Hassan is equally sure he will be able to obtain a position at State, but he also prefers the other programs. He ranks State first because he is afraid that State might fill its positions with others if he does not place it first on his list. **Applicants should rank programs in order of preference.** Their choices should not be influenced by speculations about whether a program will rank them high, low, or not at all. The position of a program on an applicant's rank order list will not affect that applicant's position on the program's rank order list, and therefore will not affect the program's preference for matching with that applicant as compared with any other of the program's applicants. During the matching process, an applicant is placed into the most preferred program that ranks the applicant and does not fill all its positions with more preferred applicants. Therefore, rank #1 should be the applicant's most preferred choice.

Applicants Davis, Eastman, and Garcia have interviewed at the same programs. Like the other applicants, they desire a position at City or Mercy and rank these programs either first or second, depending on preference. However, since they are not assured of a match to either of these desirable programs, these applicants also list State and General lower on their Rank Order Lists. **They are using the Match well.**

Summary of Guidelines for the Preparation of Applicant Rank Order Lists

1. Applicants are advised to rank, in sequence, those programs that represent their true preferences.

2. Factors to consider in determining the number of programs to rank include the competitiveness of the specialty, the competition for the specific programs being ranked, and the qualifications that the applicant offers.

3. Applicants are advised to rank all programs acceptable to the applicant, i.e., programs in which he or she would be pleased to undertake residency training. Conversely, if an applicant finds certain programs unacceptable and is not interested in accepting offers from these programs, said program(s) should not be ranked.

Program's Rank Order Lists

Two positions are available at each program. The four programs, having determined their preferences for the eight applicants, also submit rank order lists to CaRMS.

Mercy	City	General	State
1. Chen	1. Garcia	1. Beaudry	1. Beaudry
2. Garcia	2. Hassan	2. Eastman	2. Eastman
	3. Eastman	3. Hassan	3. Anderson
	4. Anderson	4. Anderson	4. Chen
	5. Beaudry	5. Chen	5. Hassan
	6. Chen	6. Davis	6. Feldman
	7. Davis	7. Garcia	7. Davis
	8. Feldman		8. Garcia

The program director at Mercy Hospital ranks only two applicants, Chen and Garcia, for his two positions, although several more are acceptable. He has insisted that all applicants tell him exactly how they will rank his program and both of these applicants have assured him that they will rank his program very highly. He delights in telling his peers at national meetings that he never has to "go far down his Rank Order List" to fill his positions. However, the advantage of a matching program is that decisions about preferences can be made in private and without pressure. Both applicants and programs may try to influence decisions in their favour, but neither can force the other to make a binding commitment before the Match. **The final preferences of program directors and applicants as reflected on the submitted Rank Order Lists will determine the placement of applicants.**

The program director at State feels that his program is not the most desirable to most of the applicants, but that he has a good chance of matching Feldman and Hassan. Instead of ranking these two applicants at the top of his List, however, he ranks more desired applicants higher. He also ranks all of the acceptable applicants to his program. **He is using the Match well.**

The program directors at City and General have participated in the matching process before. They include all acceptable applicants on their Rank Order Lists with the most preferred ranked high. These program directors are not concerned about filling their available positions within the first two ranks. They prefer to try to match with the strongest, most desirable candidates. **They are using the Match to maximum advantage.**

The Matching Algorithm at Work

The CaRMS matching algorithm uses the exact preferences stated on the Rank Order Lists submitted by applicants and programs to place individuals into positions. The process starts with an attempt to place an applicant into the program that is most preferred on the applicant's list. If the applicant cannot be matched to this first choice program, an attempt is then made to place the applicant into the second choice program, and so on, until the applicant obtains a tentative match, or all the applicant's choices have been exhausted.

An applicant can be tentatively matched to a program in this process if the program also ranks the applicant on its Rank Order List, and either:

- the program has an unfilled position. In this case there is room in the program to make a tentative match between the applicant and program.

- the program does not have an unfilled position, but the applicant is more preferred by the program to another applicant who is currently tentatively matched to the program. In this case the applicant who is the least preferred current match in the program is removed from the program to make room for a tentative match with the more preferred applicant.

Matches are referred to as tentative because an applicant who is matched to a program at one point in this process may later be removed from the program, to make room for an applicant more preferred by the program, as described in the second case above. When an applicant is removed from a previous tentative match, an attempt is then made to re-match this applicant, starting from the top of this applicant's list.

This process is carried out for all applicants, until each applicant has either been tentatively matched to the most preferred choice possible, or all choices submitted by the applicant have been exhausted. When all applicants have been considered, the match is complete and tentative matches become final.

In summary, each applicant's Rank Order List is traversed "downwards", from most preferred program to least preferred, until the first program to which the applicant can be tentatively matched is reached, or until the applicant's list of choices is exhausted. Each program accepts applicants "upwards" on its Rank Order List, continually removing less preferred matches in favour of more preferred applicants, until the program is matched to the most preferred applicants who wish to be matched to the program.

Match Results

Anderson	Beaudry	Chen	Davis	Eastman	Feldman	Garcia	Hassan
Unmatched	Unmatched	Matched to Mercy	Matched to General	Matched to City	Matched to State	Matched to City	Matched to State

At the end of the matching process, each applicant has either been matched to the most preferred choice possible, or all choices submitted by the applicant have been exhausted.

Applicant Match Results show that Anderson and Beaudry went unmatched because they listed too few choices. Applicant Hassan could have matched at City had Hassan ranked choices in order of preference.

Program Match Results illustrate that Mercy, which ranked only two applicants, and General, which ranked seven out of eight, had unfilled positions. General could have matched with Feldman, who ranked it #2, had Feldman been ranked.

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BACK UP