

2018

Certificate Authority Cup International Mathematical Contest Modeling

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Problem D(ICM)

Speed Kills Love

In the age of online dating there are more romantic options than there are fish in the, well, you know. On the appropriately named site Plenty of Fish, for instance, you can pore over profiles of hundreds or thousands of potential mates before deciding which ones to contact. Such unfettered choice means a better shot at true love—or so many daters believe. The more options you have, the assumption goes, the more likely you are to find the one who truly suits you.

Yet many daters are finding that less romantic choice yields top-notch results without all the angst. EHarmony is one of the largest dating sites in the United States which has its customers fill out a detailed compatibility survey, then sends them a restricted number of matches, typically anywhere from a few to a dozen or so at a time. The success rate of marriage is relatively high. Studies find speed daters often choose partners on the basis of appearance. When presented with fewer choices, daters are likely to spend time reflecting on a person's deeper qualities.

Barry Schwartz, Dorwin Cartwright Professor of Social Theory and Social Action at Swarthmore College, has spent years arguing that limiting our options consistently leads to better outcomes. He thinks too much choice overwhelms us and makes us unhappy—a phenomenon he calls the paradox of choice. Endless choices, Schwartz says, are more stultifying than gratifying. In one canonical experiment dubbed “the jam study,” grocery-store shoppers scanning 24 different gourmet jams were less likely to make a purchase than shoppers who looked at only six jams. The shoppers choosing from a wider selection were also unhappier with the jam they'd bought. The problem, Schwartz explains, is that when you have more options, you tend to put more pressure on yourself to make the perfect choice—and you feel more let down when it doesn't turn out to be perfect, after all. “Even when you choose well, you end up disappointed,” Schwartz says. “You're convinced that even though you did well, you should have done better.” Based on work by psychologists Daniel Kahneman and Amos Tversky, who have shown bad feelings about losses are stronger than good feelings we have about gains, Schwartz argues that as you're presented with countless choices, your pleasure at the prospect of more options is canceled

out by the anticipated loss of making a wrong choice.

If you do persist in choosing someone from a large array, not only will you come away less satisfied—you'll probably make a worse choice. When online daters had more search options in a University of Taiwan study, they spent less time considering each possibility and found it harder to sort the good prospects from the bad ones. Stretching your cognitive capacity too thinly, the researchers explain, tends to hamstring you on irrelevant details and distract you from the criteria you consider most important. That suggests that in order to assess the qualities that matter—which, for most people, are things like a partner's honesty, his dependability, her sense of humor—you need to go deeper in your search, not wider.

Does that mean you should opt for the expert-guided, custom-flight approach proffered by vendors like eHarmony? Quite a few daters appreciate curated selection enough to be willing to pay extra for it. Suppose you are a partner of an online dating website. You should finish the following tasks:

1. Create an objective quantitative algorithm or set of algorithms to complete online dating matches by few options .
2. Use your algorithm(s) to develop your "Top 20 Recommended Daters" list. And give a more suitable estimate of an ideally sized choice set when it comes to dating—one large enough to include variety and depth, yet small enough that you can fairly weigh each prospect's potential without tripping your brain's overload switch.
3. Give the design of information forms that users need to fill out for your website. Study the relationship between forms design and success rate of online dating.
4. Write a one-page non-technical News Release describing your new algorithm, results, and website.

Your submission should consist of:

- One-page Summary Sheet,
- One-page News Release,
- Your solution of no more than 30 pages, for a maximum of 32 pages with your summary and news release.

Note: Reference list and any appendices do not count toward the 32-page limit and should appear after your completed solution.