

FiTech: Data Driven Credit Card Design

Your goal is to maximize profits from solicitation 23-1 by planning and implementing mailings of up to 12 different product offers to up to 750,000 prospects.

There are 750,000 people in a database: 250,000 in each of three BK groups (150, 200, and 250). You can send, at most, one solicitation (product) to each prospect. Each solicitation can offer one, and only one, of the 12 available products, but you can send different solicitations to different prospects. You can send your solicitations in two separate mailings (**test** and **roll out**). See the fitech-case.html file in the github repo for more information about the cost of developing and sending a solicitation.

Note: You only get one shot at this! You can send out only one test mailing and one roll-out mailing. It is not possible to reset the exercise, even if you make a mistake in either mailing. Please make your decisions carefully.

One week before the due date I will provide access to one person in each team. To login to the exercise, submit decisions, or review team results go to:

<https://rsm-shiny-02.ucsd.edu/fitech/>

Read the provided information in the Welcome, Round 1, and Round 2 tabs carefully before proceeding.

Preparation questions:

1. Why does Customer Lifetime Value vary with BK score? Why does Customer Lifetime Value vary by product? (See Exhibit 2 to help answer these questions) **(3 points)**
2. Are predictive models estimated on historical data useful in this case? If so, why? If not, why not? **(4 points)**
3. Is there a “best product” that will likely be preferred by all customers? If so, what is it? **(3 points)**
4. Describe and justify your testing strategy **(10 points)**
5. Generative AI **(5 points)**:

Please describe how you used Generative AI-tools like ChatGPT to support your work on this assignment and enhance your learning. Create a pdf where you organize your interactions with AI and comment on what things did and did not go well. Bring any questions you may have about the assignment and the support you received from GenAI to class so we can discuss.

Make sure to include:

- Specific examples of prompts you used
- How the AI responses helped or hindered your understanding
- Any limitations or challenges you encountered
- Key insights gained from using GenAI tools

- Questions that arose during your interactions with AI
- How GenAI complemented your learning process

Note: No matter how you used Generative AI-tools, you will be expected to understand and talk meaningfully about the work you submitted for this assignment. You may be called on in class to walk us through your thought process and calculations.

Write-up Instructions:

Please create a notebook describing your work on the steps listed above. The text in the notebook, excluding exhibits, should **not** be more 1,000 words. Please push your work to GitHub and submit through GradeScope before the due date.

Presentation:

In addition to your Jupyter notebook with analysis and text, with your team, create a video presentation that lasts no more than 10 minutes and that covers your approach to solving the case. Target your presentation to (1) the senior data scientist at the company and (2) the chief product manager for credit cards at FiTech bank. You should explain the technical details of your work and provide context on the proposed next steps in decision making. Please use the FiTech directory in the Panopto Page to upload the link to your group video (**10 points**)

Grading system:

We will use results from the interactive web simulation to assess your testing strategy. 10 points will be based on the total profit generated in the exercise (i.e., round 1 + round2) and 25 points will be based on the quality of your analysis, supporting arguments, and use and discussion of GenAI in the write-up. A final 10 points will be assigned based on the quality of your group's presentation.

Hints:

- Exhibits are available on GitHub (data/exhibits.xls).
- In exhibit 1, "Number of Accounts" is the number of people that responded to the mailing and opened an account (i.e., "resp" in the data/exhibits.xlsx).
- If you use Radiant-for-R to generate a (partial) factorial design, make sure to clearly describe what assumptions you are making and why you believe they are justified in this case. Also, try different *random seeds* (e.g., 19, 1234, or 172110) and discuss the impact of these different settings on the factorial design (i.e., are they the same?) and on your subsequent decisions.
- What sample size should be used for a cell? As a guideline try 4,000 per cell. This is approximately the sample size you would need to distinguish between a 2% and a 3% response rate. Note, however, that this is just a guideline – you can deviate from it if you believe there is a need for more (or less) precision. You can re-calculate this sample size yourself using *Design > Sample size (compare)* in Radiant-for-R.
- The results from round 1 will be returned as a table on a webpage. You can copy-and-paste the table to Excel. Videos on how to generate an experimental design (partial or full factorial) and analyze data in table format are provided on Canvas.