Homework is just for practice! No need to turn it in anywhere. Solutions will be posted. Come to office hours if you want to discuss any of the problems!

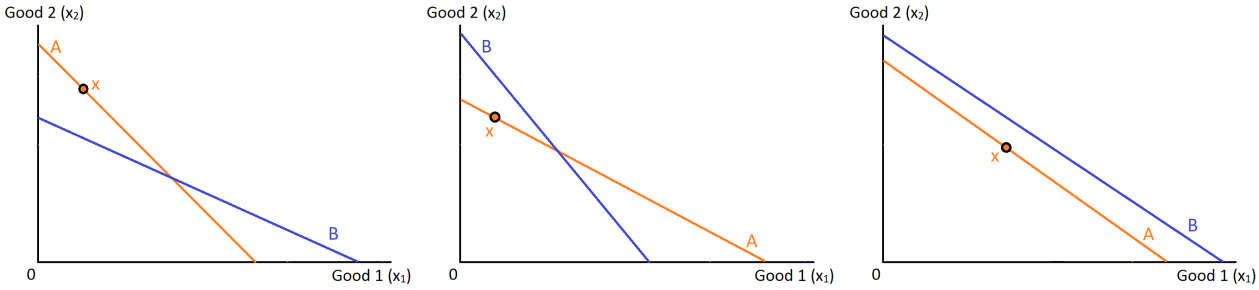
1. Say that there are three alternatives, x, y, and z. You observe a few of a decision maker's choices. In the following examples, (i) are the choices that you see consistent or inconsistent with the IIA assumption, and (assuming $c(i) = \{i\}$ for all i) (ii) can we say whether or not the DM has a rational preference relation over x, y, and z? Explain your answers.

   a) Decision maker 1: $c(x, y) = \{x\}$, $c(x, z) = \{z\}$, $c(x, y, z) = \{x\}$

   b) Decision maker 2: $c(x, y) = \{x\}$, $c(x, z) = \{x\}$, $c(y, z) = \{y\}$, $c(x, y, z) = \{x\}$

   c) Decision maker 3: $c(x, y) = \{y\}$, $c(x, z) = \{x\}$, $c(y, z) = \{y\}$

2. In each of the three situations depicted below, say that you have observed the decision maker face the budget set bounded by line A and that they chose $c(A) = \{x\}$. If you also observed their choice from the budget set bounded by line B, what choices from that budget would be consistent with WARP and what choices would violate WARP? Be as specific as possible, and explain your answers. [You can answer in words or by reproducing the diagrams to indicate the relevant areas. For simplicity, assume that x is not in the DM's choice set from budget B.]



3. You work for a company that produces two smartphone models. Model A has 256GB of storage and an 8 megapixel camera; model B has 128GB of storage and a 10 megapixel camera. At the moment sales of the two models are roughly equal.

   a) Say that you are asked by your boss to boost sales of model B. Suggest attributes for a new model C that would achieve this goal by harnessing the attraction effect. Explain your answer and illustrate with a diagram.

   b) Say that you are asked by your boss to boost sales of model A. Suggest attributes for a new model C that would achieve this goal by harnessing the compromise effect. Explain your answer and illustrate with a diagram.

4. **a)** Jim is at a party and there is cake. He likes cake but doesn't want to look greedy, so he takes the slice of cake that is closest to the average size among all the available slices. Is this procedure in general consistent with IIA? Either explain why it is or give and explain a counterexample.

b) Consider an application of the optimal stopping model of satisficing. There are n items each of whose utility to the decision maker is drawn independently from a uniform distribution on $[0, 1]$. What must the cost k of inspecting each item be such that the DM will optimally choose to stop searching after finding an item of utility $\frac{1}{2}$ or better?

5. Jim is procrastinating. He needs to write a problem set for Econ 119, but because of his busy social calendar he has a decision to make. There are three Zoom parties in the next three days, and Jim must choose one of them to skip so that he can write the exam. Party A is today, B is tomorrow, and C is the next and final day. Jim's instantaneous utility from each party is as follows:

$$U(A) = 5, U(B) = 4, U(C) = 7. \tag{1}$$

On the day Jim skips a party to write the exam, he gets zero utility. First assume that Jim has time consistent preferences (exponential discounting) with $\delta = 1$.

a) Which party will Jim skip?

Now assume that Jim discounts according to the beta-delta model with $\delta = 1$ and some $\beta \in (0, 1)$.

b) For what range of β will Jim display time inconsistency (that is, making a plan but failing to stick to it)?

c) Fix $\beta = \frac{1}{2}$. Say that each unit of utility is worth \$10 to Jim, and that he is sophisticated. From the perspective of today, how much would he be willing to pay for a commitment device that guaranteed he would stick the plan he makes today?

d) In c) we assumed that Jim was sophisticated. Briefly explain what it means in this context for a DM to be sophisticated vs. naive and why it matters for behavior.

6. In class we saw applications of a rational inattention model to prices in the store and car odometer readings. Say that you conjecture that there might be rational inattention to digits after the decimal point in grade point averages. What would be your ideal data set to try to test that theory? Explain what effect you would be looking for and how your data would help you cleanly identify it. [300-400 words]