

ECON 251: Model Assignment 1

Due Sunday October 2 by 11:00 PM

Your assignment is to write down an economic model, a formal mathematical framework characterizing an individual choice situation similar to (but **not** identical to) the ones discussed in class. For this assignment, you should characterize (i) a budget set with a budget line that is kinked or non-linear and (ii) a reasonable demand function that a decision-maker might use given the budget set that you characterized.

Characterize an individual choice situation that generates a non-linear or kinked budget line over **two** goods. Describe an individual who has a budget measured in units of a scarce resource that they need to allocate (i.e. divide or spend). The choice situation that you describe can reflect your own life, or it can reflect a choice setting that you think is socially, economically, or psychologically important. Your setup should not be one that we covered in class or in the problem sets.

I encourage you to be creative both conceptually and mathematically. We have spent a great deal of time discussing various money budget sets, so I would encourage you to focus on a different type of scarce resource. Your mathematical characterization of the kinked or non-linear budget should reflect something fundamental about the nature of the trade-off that your decision-maker is facing, and ideally this will not simply be a re-labeling of a mathematical setup that we have already analyzed.

Your submission should be typed, and it should not be longer than two sides of a page in 11-point or 12-point font. Submissions must be pdfs, which you will upload to gradescope. Your submission must include the following:

- A brief introductory paragraph (one or two sentences) explaining the economic context you are modeling
- A clear explanation of what the budget is: what is the scarce resource being allocated, and what units are we measuring it in?
- A clear description of the price or cost of each of the two goods, with an explicit statement of why the cost structure takes the form that it does (e.g. this is the market price of carrots, or it takes Super Parent x^2 minutes to cook x meals because they get tired and slow down)
- A graph of the individual's budget set
- An explanation of the decision rule both in words and in math (e.g. Vegan Val wants to eat equal numbers of carrots and cucumbers, so she sets $x_{carrot} = x_{cuke}$)
- The demand function that results from your decision rule

What I Am Looking For:

I want to see you apply the theoretical tools that we are building in class to a new and economically interesting situation (remember: Gary Becker tells us economics is an approach and not a topic, so feel free to think outside the box). I am looking to see you represent a decision problem in mathematical terms, as a tradeoff characterized by a budget set and implicit or explicit prices or opportunity costs.

In grading your assignments, I will be looking at the following:

- Is your setup both conceptually and mathematically different from the ones we've discussed in class?
- Is your setup interesting and important? This does not mean that you need to write about climate change – there are a lot of great economics papers written about when people go to the gym – but it should capture an important tradeoff that many people face, and one that has economic or social consequences.
- Does your mathematical representation of the budget set (and particularly the source of the kink or non-linearity) capture some fundamental intuition about the nature of the tradeoff your decision-maker is facing?
- Have you included everything I asked? Is the information presented clearly, and in a way that is easy for me to read and understand?
- Have you translated your verbal description into a correct mathematical description of the budget set as well as a correct graph?
- Have you translated your decision rule into a demand function correctly?

It should be (I hope) fairly easy for you to do an acceptable-but-not-great job on this assignment. But it is **very** hard to do everything that I have asked for successfully. You are essentially proposing a theory paper, which is something that people go to grad school for. Don't feel stressed if this assignment is challenging. You will have time to get better at this over the course of the semester.