

Dynamic Methods

Question 1

You are given a function: $\max\{-e^{(-u)-\frac{1}{2}e^{-xt}}\}$ subject to $u_t = 2x_t - x_t + 1$

There is no end date, you need to find the correct equation for this function using a method of choice (I was not sure if I needed to use guess and verify or the Euler equation, this was quite a tough question according to most)

Question 2

- a) What is the crucial theorem that the NFXP relies on?
- b) What is the crucial assumption that the NFXP relies on?
- c) On what theorem does the Hotz and Miller algorithm rely?
- d) What feature is necessary for the CCP and OSA to work?

Question 3

- a) List all the different steps that the BBL uses
- b) What can we use as an alternative estimator instead of ML? What are its advantages?
- c) Rewrite the conditional value function, split it into a constant and a part conditional on the probability
- d) split the other part of the CVF into the current pay-offs a constant and something else
- e) What loops are there in the BBL algorithm are they nested?

Question 4

here you got 3 questions that were similar to the first 2 assignments. For instance, we were supposed to make a dynamic model with constraints for an individual who had a consumption, a risk of infection (which depends on consumption) which leads to a guaranteed quarantine (which the agent dislikes) and a possibility of death. If the agent survives, she becomes immune for the rest of her life. In the second question, we were supposed to make something similar from the perspective of a social planner, but now there was no chance of dying but the quarantine could only end with a probability of z , there was also no immunity.

In general, this question was hard to study for, but according to the question itself, there were multiple possible correct answers.