Advanced Microeconomics

Assignment 1

Due date: September 16, 2019 (before class)

Submission method: Please submit your assignment to me in class, or via E-mail: sherryecon@qq.com.

- 纸质版：要求字迹工整，可辨认。
- 电子版：附件要求.pdf 格式。邮件标题格式为“作业编号-学号-姓名”，
  如：作业 1-201901010101-张三。

Grading: Your assignment will be graded based on your effort, not the accuracy of your answers.

The exercises are embedded in the Chapter 1 lecture notes (red boxes). You are advised to read the relevant sections when you work on the exercises.

The same set of exercises are provided below:

1.B.3 Show that if $f : \mathbb{R} \to \mathbb{R}$ is a strictly increasing function and $u : X \to \mathbb{R}$ is a utility function representing preference relation $\succsim$, then the function $v : X \to \mathbb{R}$ defined by $v(x) = f(u(x))$ is also a utility function representing preference relation $\succsim$.

1.C.1 Consider the choice structure $(\mathscr{B}, C(\cdot))$ with $\mathscr{B} = (\{x, y\}, \{x, y, z\})$ and $C(\{x, y\}) = x$. Show that if $(\mathscr{B}, C(\cdot))$ satisfies W.A.R.P, then we must have $C(\{x, y, z\}) = \{x\}, = \{z\}$, or $= \{x, z\}$.

1.C.2 Show that W.A.R.P (Definition 1.C.1) is equivalent to the following property holding:

Suppose that $B, B' \in \mathscr{B}$, that $x, y \in B$, and that $x, y \in B'$. Then if $x \in C(B)$ and $y \in C(B')$, we must have $\{x, y\} \subset C(B)$ and $\{x, y\} \in C(B')$.

1.D.2 Show that if X is **finite**, then any rational preference relation generates a nonempty choice rule; that is, $C(B) \neq \varnothing$ for any $B \subset X$ with $B \neq \varnothing$. [hint: utilize the result of Remark 1.]

1.D.3 Let $X = \{x, y, z\}$, and consider the choice structure $(\mathscr{B}, C(\cdot))$ with

$$\mathscr{B} = \{\{x, y\}., \{y, z\}, \{x, z\}, \{x, y, z\}\}$$

and $C(\{x, y\}) = \{x\}$, $C(\{y, z\}) = \{y\}$, and $C(\{x, z\}) = \{z\}$, as in Example 1.D.1. Show that $(\mathbb{B}, C(\cdot))$ must violate W.A.R.P.