Version 1

1. EU("do it on 0th day") = $u(0) + \beta[\delta \cdot 0 + \delta^2 \cdot 0 + \delta^3 \cdot 0]$
$= \boxed{-10}$

EU("do it on 1st day") = $0 + \beta[\delta u(1) + \delta^2 \cdot 0 + \delta^3 \cdot 0]$
$= \beta u(1) = \boxed{-11\beta}$

EU("do it on 2nd day") = $0 + \beta[\delta \cdot 0 + \delta^2 u(1) + \delta^3 \cdot 0]$
$= \beta \delta^2 u(1)$
$= \beta \cdot 1 \cdot (-10 - 2^1)$
$= \boxed{-14\beta}$

EU("do it on 3rd day") = $0 + \beta[\delta \cdot 0 + \delta^2 \cdot 0 + \delta^3 u(3)]$
$= \beta \cdot 1 \cdot u(3)$
$= \beta \cdot 1 \cdot (-10 - 9) = \boxed{-19\beta}$

Being naive means the DM doesn't see the problem coming, and this is important b/c it reveals time inconsistency, where how the DM feels in the present will differ from how they will feel in the future

(b) DM prefers doing it on day 2 instead of day 1
Pick day 1: $u(1) + \beta(0) = -11$
Pick day 2: $0 + \beta(\delta u(1) + \delta^2 0) = -14\beta$
EU(day 2) $\geq$ EU(day 1)
$-14\beta \geq -11$
$\boxed{\beta \geq 11/14}$

Version 1

2. (a) We know that $u(400) > \frac{1}{3}u(100) + \frac{2}{3}u(z)$

$$\sqrt{400} > \frac{1}{3}\sqrt{100} + \frac{2}{3}\sqrt{z}$$
$$20 > \frac{10}{3} + \frac{2}{3}\sqrt{z}$$
$$60 > 10 + 2\sqrt{z}$$
$$\sqrt{z} < 25$$
$$z < 625$$

(b) $EU(\text{Not } L) = 0.05 \cdot u(100) + 0.10 \cdot u(z) + 0.85 \cdot u(0)$

If the DM picks the non-L lottery, and is revealed that they cannot be an EU type, then we know that

$$EU(L) > 0.05 u(100) + 0.10 u(z) + 0.85 u(0)$$

Version 1

3. Say we have a set D with items 1, 2, ..., 10 and the utility they receive $u(i) = i$. Let the "good enough" value for the DM be $v(i) = i > 7$.

Say the ordering is the following: $\{0, 8, 1, 2, 3, 4, 5, 6, 7, 9, 10\}$

From left to right, the DM will stop at the second item b/c $8 > 7$, and she has found a "good enough" item.

However, if we take a subset of D and reframe the ordering such that $S \in D$: $\{0, 9, 10, 8\}$, the DM will stop at the new second item, 9, having found it "good enough".

This breaks IIA since 8 was still part of the subset, yet 9 was picked instead since 8 fell to the back of the line when the subset was created.

Version 2

4. If our goal is to figure out if Berkeley students display an endowment effect in registering for courses, then we want to home in on summer classes, b/c students pay by unit instead of a flat-rate fall/spring tuition.

This distinction allows us to measure their willingness to pay for a course, since we have this per-unit cost attached.

For highly-competitive-enrollment classes that are extremely popular and have high waitlists, there is a market for registration, where there is high demand to get enrolled.

This is very common for intro-level CS and DS courses.

We can survey students' willingness to pay by asking how much per-unit fee they would pay to be in the course.

For those already inside the class, we can survey their willingness to accept by asking how much they are willing to receive per-unit to drop the course

Any significant difference btwn these two statistics (take the difference of the averages) can reveal the endowment effect