EXAMPLE 2. Choice is between

- \$100 in 12 months or
- \$160 in 16 months

$u_t(\$x) = \sqrt{x}$, for all t and $\delta = 0.95$

(A) Exponential discounter:

$U_0(\$100,12) =$ $\sqrt{100}\ \delta^{12} = 10(0.95)^{12} = 5.4$

$U_0(\$160,16) =$ $\sqrt{160}\ \delta^{16} = 5.57$

so that $(\$160,16) \succ_0 (\$100,12)$

time consistent

$U_{12}(\$100,12) =$ $\sqrt{100}\ \delta^{0} = 10$

$U_{12}(\$160,16) =$ $\sqrt{160}\ \delta^{4} = 10.3$

so that $(\$160,16) \succ_{12} (\$100,12)$

(B) Hyperbolic discounter with $\beta = 0.8$

$U_0(\$100,12) =$ $\sqrt{100}\ \cdot \delta^{12} \cdot \beta = 10(0.95)^{12} \cdot (0.8) = 4.32$

$U_0(\$160,16) =$ $\sqrt{160}\ \delta^{12} \cdot \beta = 4.46$

so that $(\$160,16) \succ_0 (\$100,12)$

time inconsistent

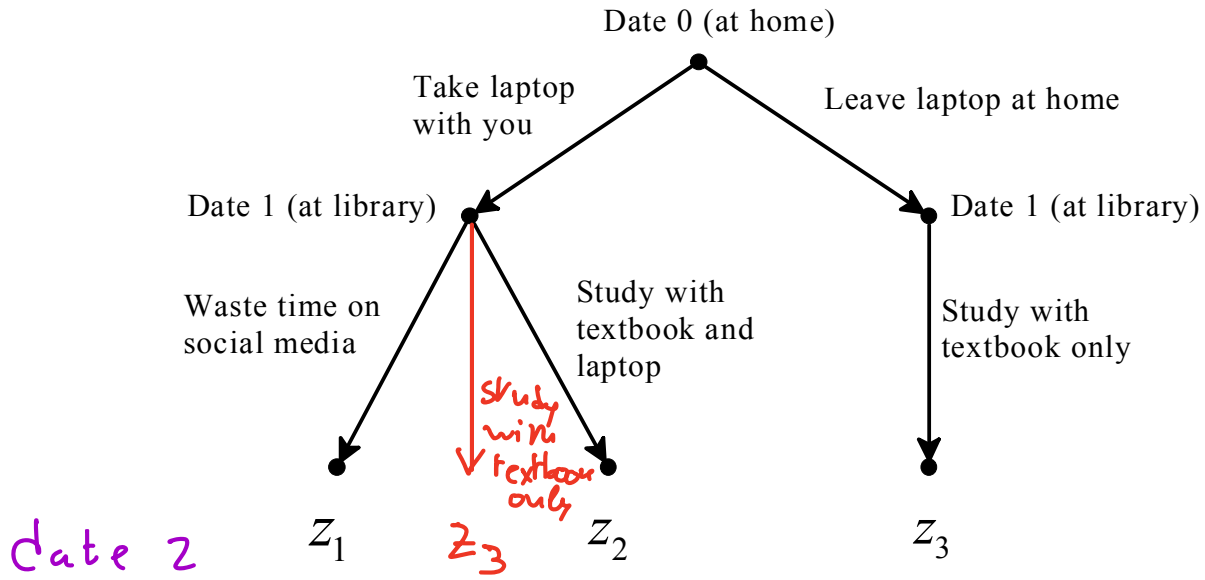
$U_{12}(\$100,12) =$ $\sqrt{100} = 10$

$U_{12}(\$160,16) =$ $\sqrt{160}\ \cdot \delta^{4} \cdot \beta = 8.24$

so that $(\$100,12) \succ_{12} (\$160,16)$

Dealing with time inconsistency

EXAMPLE 1. You have a final tomorrow. You are going to the library to study.



Your ranking at Date 0 is:

		Utility:
best	z_2	2
	z_3	1
worst	z_1	0

You realize that your ranking at Date 1 will be:

		Utility:
best	z_1	2
	z_2	1
worst	z_3	0

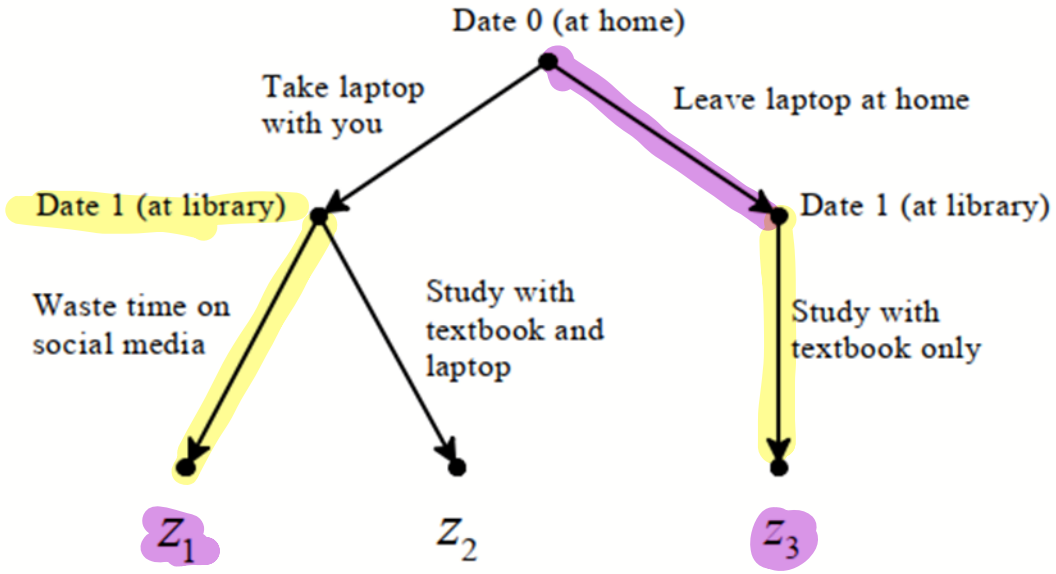
Utility :

best

Your ranking at Date 0 is:

worst

IF you can commit:



	z_1	z_2	z_3
Date 0 utility	0	2	1
Date 1 utility	2	1	0

HOW CAN YOU COMMIT?

Once started, **it cannot be undone by the application**, by deleting the application, or by restarting the computer – you must wait for the timer to run out.

Concentrate

When I activate "Writing," the app automatically closes my email client and Internet Browser; blocks me from Twitter, Facebook, and YouTube; launches Microsoft Word; and sets my instant messaging status to "away". *For Macs only.*

FocusWriter

FocusWriter re-creates a word processor-like environment, blocking out absolutely everything on your screen except for the words you type on a simple grey background – all menus (date, timer, dock, etc) are tucked away until rollover. *For Macs and PCs.*

Anti-Social

Rather than blocking the Internet in its entirety, Anti-Social automatically blocks all of the known time-sinks for a set period of time. Sites that are off-limits include Twitter, Facebook, Flickr, Digg, Reddit, YouTube, Hulu, Vimeo, and all standard web email programs. *For Macs and PCs.*

StayFocusd

This extension, for users of Google's Chrome browser, works in the reverse manner to Anti-Social or Self-Control. Rather than setting a period of time for which you CANNOT use the Internet, it allows you to set a period of time to indulge in time-wasting sites. Only want to give yourself 60 minutes a day for Twitter, vanity Googling, and updating your Netflix queue? This is your app. Rather like when you were a kid and only allowed to watch 2 hours of TV a day. For Firefox users, LeechBlock performs a similar function. *For Macs and PCs.*

EXAMPLE 2.

You have promised to help a friend paint her house (activity x) either this weekend (Date 1) or the next (Date 2) or the following one (Date 3). The instantaneous utility of x is the same at every date: $u_t(x) = 1$, for every t = 1,2,3. You are also a member of the snowboarding club which has trips planned for all three weekends. Call y the activity of joining the trip and suppose that

$$u_1(y) = 6 \qquad u_2(y) = 8 \qquad u_3(y) = 12$$

So you have three possible plans:

Choice	First weekend (Date 1)	Second weekend (Date 2)	Third weekend (Date 3)
A	*x*	*y*	*y*
B	*y*	*x*	*y*
C	*y*	*y*	*x*

Replacing outcomes with instantaneous utilities:

Choice	First weekend (Date 1)	Second weekend (Date 2)	Third weekend (Date 3)
A	1	8	12
B	6	1	12
C	6	8	1

Choice	First weekend (Date 1)	Second weekend (Date 2)	Third weekend (Date 3)
A	1	8	12
B	6	1	12
C	6	8	1

Suppose that your preferences are represented by the hyperbolic utility model with discount factor $\delta = 0.85$ and present-bias parameter $\beta = 0.7$.

$U_1(A) =$ $1 + 8 \cdot (0.85)^1 (0.7) + 12 \cdot (0.85)^2 \cdot (0.7) = 11.829$

$U_1(B) =$ $6 + 1 \cdot (0.85)^1 (0.7) + 12 (0.85)^2 \cdot (0.7) = 12.664$ $\quad B \succ_1 A \succ_1 C$

$U_1(C) =$ $6 + 8 \cdot (0.85)^1 (0.7) + 1 (0.85)^2 \cdot (0.7) = 11.266$

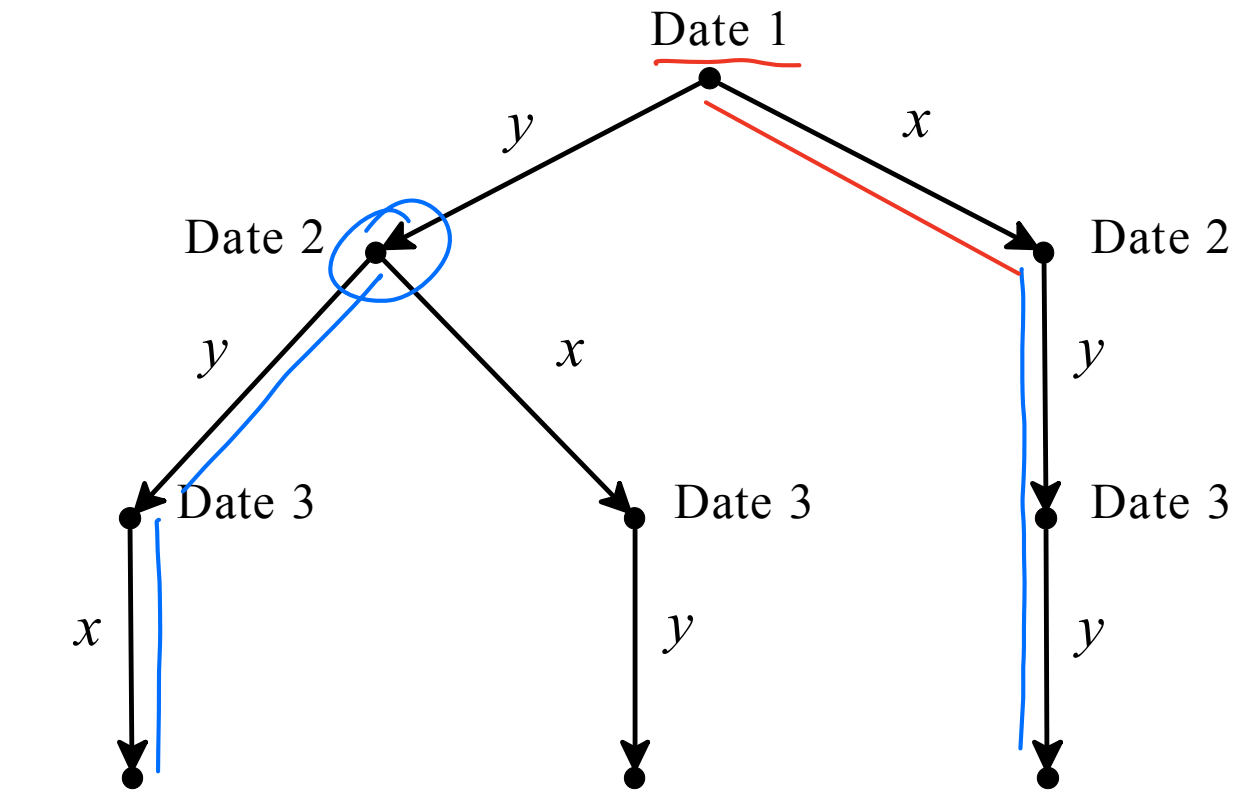
So your ranking at Date 1 is:

However, if you know your own preferences you know that (plan A not available any more)

$U_2(B) =$ $1 + 12 (0.85)^1 \cdot (0.7) = 8.14$

$U_2(C) =$ $8 + 1 (0.85)^1 (0.7) = 8.59$ $\quad C \succ_2 B$

So that you understand that your ranking at Date 2 will be:



$U_1(Plan\ C) =$ 11.266

$U_1(Plan\ B) =$ 12.664

$U_1(Plan\ A) =$ 11.829

$U_2(Plan\ C) =$ 8.59

$U_2(Plan\ B) =$ 8.14