1 Chapter 5 (Well Behaved Preferences)

1.1 Rational Preferences

$Complete, Transitive$

$$(1,1) \succ (5,5) \succ (0,0)$$

1.2 Monotonicity

More is better

This violates monotonicity:

$$(1,1) \succ (5,5)$$

This does not violate monotonicity:

$$(5,5) \succ (1,1)$$

When precisely does a preference relation meet the assumption of **monotonicity.** (When is it monotonic?)

For any two bundles (x_1, x_2) and (y_1, y_2)

If one bundle has at least as much of both, then it is at least as good:

$$x_1 \geq y_1 \& x_2 \geq y_2$$

Then

$$(x_1, x_2) \succsim (y_1, y_2)$$

And

If it has strictly more of both things, it must be strictly better.

$$x_1 > y_1 \& x_2 > y_2$$

Then

$$(x_1, x_2) \succ (y_1, y_2)$$

Having at least as much of both is at least as good and having strictly more of both must be strictly better.

1.2.1 Examples

$(3,3)\,,(2,2)$ the bundle $(3,3)$ has at strictly more of both things, it must be strictly better.

$$(3,3) \succ (2,2)$$

$(3,3)\,,(3,2)$

$$(3,3) \succsim (3,2)$$

Suppose finn only cares about the amount of vanilla in the bowl of ice cream.

$$(3,3) \sim (3,2)$$

$$(3,3) \succ (2,2)$$

1.2.2 Violation

$$(3,2) \succ (3,3)$$

This violates monotonicity since $(3,3)$ has a least as much of both things it must be at least good, but it isn't it **is strictly worse.**

$$(2,2) \succ (3,3)$$

This violates monotnicity since $(3,3)$ has strictly more of everything it must be strictly better, but it isn't it **is strictly worse.**

$$(3,3) \sim (2,2)$$

This violates monotnicity since $(3,3)$ has strictly more of everything it must be strictly better, but it isn't it **is indifferent.**

1.2.3 Rules Out

Monotonicity Rules out

"Bads" (things you would rather have less of).

Preferences over cake and trash.

$$(3,0) \succ (3,3)$$

2 Convexity

Mixtures (Averages) are at least as good as extremes

$$(2,0) \sim (0,2)$$

I can get the bundle $(1,1)$ by taking an average of the bundles $(2,0)$ and $(0,2)$. Convexity requires that $(1,1)$ is at least as good at the extremes.

$$(1,1) \succsim (2,0)$$

$$(1,1) \succsim (0,2)$$

2.0.1 Another Mixture

$$(2,0) \sim (0,2)$$

$$\frac{3}{4}(2,0) + \frac{1}{4}(0,2)$$

$$\left(\frac{3}{4} * 2 + \frac{1}{4}0, \frac{3}{4}0 + \frac{1}{4}2\right)$$

$$(1.5, 0.5)$$

$$\frac{1}{4}(2,0) + \frac{3}{4}(0,2)$$

$$(0.5, 1.5)$$

$$\frac{1}{8}(2,0) + \frac{7}{8}(0,2)$$

$$(0.25, 1.75)$$

These bundles are called “Convex Combinations”

For the two bundls (x_1, x_2) and (y_1, y_2). The convex combinations are:

Pick a $t \in [0, 1]$

t is the weight on bundle 1, $1 - t$ is the weight on bundle 2.

$$(tx_1 + (1 - t)\, y_1, tx_2 + (1 - t)\, y_2)$$