9/28

# DISCUSSION 1

1) Notation. $A_i := \times_{j \in N \setminus \{i\}} A_j$, $u_i : A \to \mathbb{R}$

(:= defined as; × Cartesian product; $\setminus$ other than; $\mathbb{R}$ real numbers)

a) Strict dominant: best action irrespective of other's action.

Find the strictly dominant strategy for both players: (D, R).

| Me \ You | L | R |
|---|---|---|
| U | 10, 10 | 3, 12 |
| D | 12, 3 | 4, 4 |

b) What is $u_{me}$? $u_{me}(U, L) = 10$. $u_{me}(D, L) = 12$. So on...

c) What is N? $N = \{Me, You\}$.

d) What is $A_{me}$, $A_{you}$? $A_{me} = \{U, D\}$, $A_{you} = \{L, R\}$.

e) What is $A_{-me}$? $A_{-me} = \{L, R\}$.

f) Pareto efficient if you cannot make someone better off without making someone worse off. (veto-proof). Are (D, R) and (U, L) efficient?

(D, R) no. (U, L) yes. Dilemma is dominant action not efficient

2) Pareto.

a) There is \$100 to be split between Anne and Ben. Is \$50 / \$50 Pareto efficient? Yes

b) Is \$100 / \$0 Pareto efficient? Yes

c) Anne likes apples $\succ_A$ bananas. Ben likes bananas $\succ_B$ apples. Is Anne get banana / Ben gets apple efficient? No.

## Preferences

**Assumptions**
- Complete: $a \succsim_i b$ or $b \succsim_i a$
- Transitive: $a \succsim_i b$ and $b \succsim_i c$ implies $a \succsim_i c$.

**Definitions**
- Indifferent: $a \sim_i b$ if $a \succsim_i b$ and $b \succsim_i a$.
- Strictly prefer: $a \succ_i b$ if $a \succsim_i b$ and <u>not</u> $b \succsim_i a$.

a) Is $\succsim_i$ complete? No.
Is $\succ_i$ complete? No.

b) Say an individual has utility function $u$. Are her preferences complete and transitive? Yes, numbers are complete and transitive.
$u(a) = 0$. $u(b) = 1$. $u(c) = 5$ $u(d) = 3$.

c) Does $2 \cdot u_i$ represent same prefences? Yes!
$u(a) = 0$ $u(b) = 2$ $u(c) = 10$ $u(d) = 6$.
Same with $2u_i + 100$?
$u(a) = 100$ $u(b) = 102$ $u(c) = 110$ $u(d) = 106$.
Idea is that utility is <u>unitless</u>.