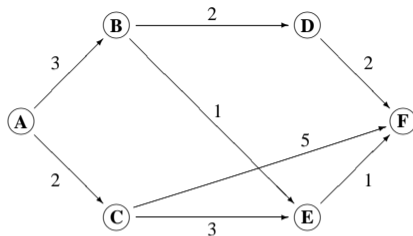


VCG Example

Game Theory Course:
Jackson, Leyton-Brown & Shoham

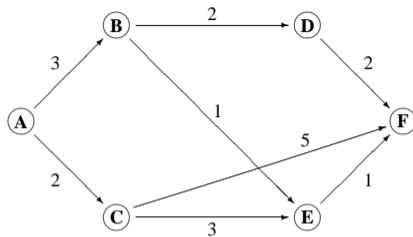
Selfish routing example



- What outcome will be selected by χ ?



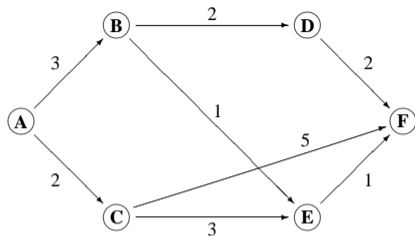
Selfish routing example



- What outcome will be selected by χ ? path $ABEF$.

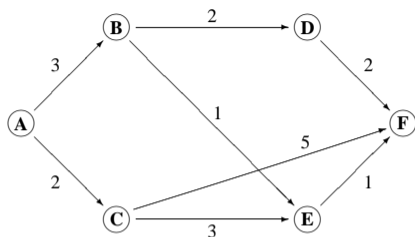


Selfish routing example



- What outcome will be selected by χ ? path $ABEF$.
- How much will AC have to pay?

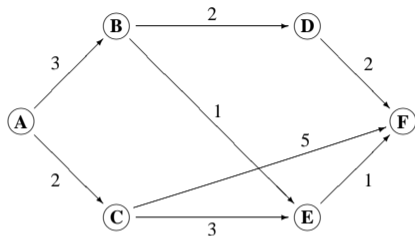
Selfish routing example



- What outcome will be selected by χ ? path $ABEF$.
- How much will AC have to pay?
 - The shortest path taking AC 's declaration into account has length 5, and imposes cost -5 on agents other than AC . The shortest path without AC 's declaration also has length 5. Thus, $p_{AC} = (-5) - (-5) = 0$.
 - This is what we expect, since AC is not pivotal.
 - Likewise, BD , CE , CF and DF will all pay zero.

[illegible]

Selfish routing example



- How much will AB pay?
 - The shortest path taking AB 's declaration into account has length 5, and imposes cost 2 on other agents.
 - The shortest path without AB is $ACEF$, which has cost 6.
 - Thus $p_{AB} = (-6) - (-2) = -4$.

Game Theory

Bayesian Normal-form auctions

equilibrium classifiers

math

Online

probability

zero-sum

strategies

predator

Nash equilibria

tragedy of the commons

repeated

cooperative payoff utility

paradox

behavior

rational

action

random

paper

Extensive-form

game

form

reactions

formal

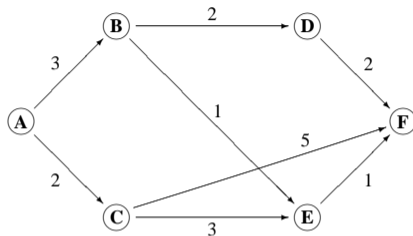
model

game

theory



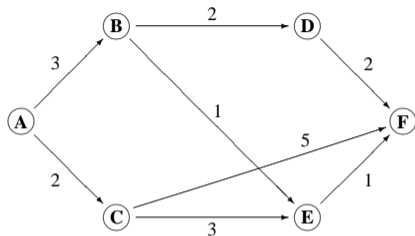
Selfish routing example



- How much will BE pay? $p_{BE} = (-6) - (-4) = -2$.



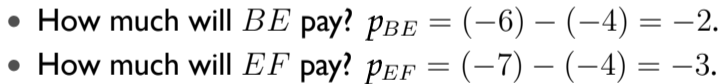
Selfish routing example



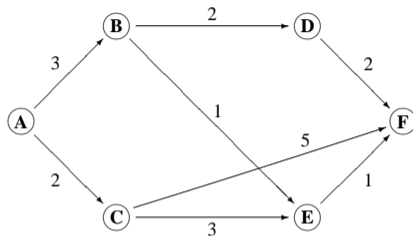
- How much will BE pay? $p_{BE} = (-6) - (-4) = -2$.
- How much will EF pay?



cooperative payoff utility
 shared resource modeling paradox prisoner's dilemma
 Bayesian Normal-form auctions common
 decision form cooperative game form
 Game Theory
 Nash equilibria class rational math
 equilibria tragedy of the commons
 repeated
 predator
 strategies
 zero-sum probability Online
 game form cooperative game form

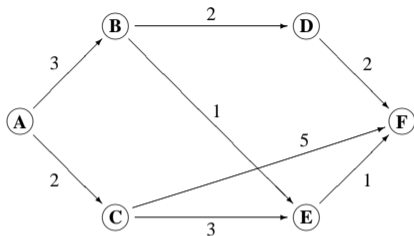


Selfish routing example



- How much will BE pay? $p_{BE} = (-6) - (-4) = -2$.
- How much will EF pay? $p_{EF} = (-7) - (-4) = -3$.
 - EF and BE have the same costs but are paid differently. Why?

Selfish routing example



- How much will BE pay? $p_{BE} = (-6) - (-4) = -2$.
- How much will EF pay? $p_{EF} = (-7) - (-4) = -3$.
 - EF and BE have the same costs but are paid differently. Why?
 - EF has more **market power**: for the other agents, the situation without EF is worse than the situation without BE .