

The Lone-Chooser Method

Lecture 16
Section 3.4

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1 The Lone-Chooser Method

2 Example – 3 Players

3 Example – 4 Players

4 Assignment

Outline

1 The Lone-Chooser Method

2 Example – 3 Players

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4 Assignment

The Lone-Chooser Method

Definition (The Lone-Chooser Method)

In the **lone-chooser method**,

- One player is designated to be the **chooser**.
- The other players are the **dividers**. They divide the assets among themselves (details to follow).
- Then each of the dividers divides his share into equal **subshares**.
- The chooser then chooses one subshare from each of the dividers.
- The dividers keep the subshares that are left.

The Lone-Chooser Method

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 - A starts off with all the assets.
 - Then A divides them into 2 equal shares. B chooses one of them.

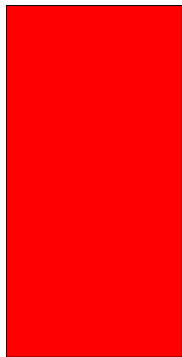
The Lone-Chooser Method

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- For example, if there are 4 players A , B , C , and D .
 - A starts off with all the assets.
 - Then A divides them into 2 equal shares. B chooses one of them.
 - Then A and B each divide their shares into 3 equal subshares. Player C chooses one subshare from each.

The Lone-Chooser Method

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- For example, if there are 4 players A , B , C , and D .
 - A starts off with all the assets.
 - Then A divides them into 2 equal shares. B chooses one of them.
 - Then A and B each divide their shares into 3 equal subshares. Player C chooses one subshare from each.
 - Then A , B , and C each divide their shares into 4 equal subshares. Player D chooses one subshare from each.

The Lone-Chooser Method



A

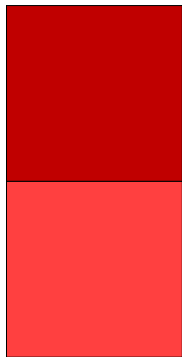
B

C

D

A starts with all the assets

The Lone-Chooser Method



A

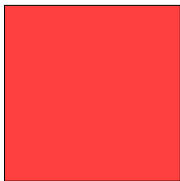
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C

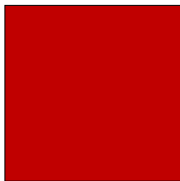
D

A divides them into 2 equal shares

The Lone-Chooser Method



A



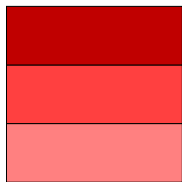
B

C

D

B chooses one of the shares

The Lone-Chooser Method



A



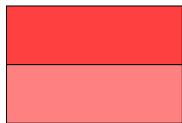
B

C

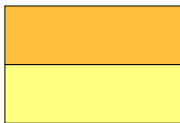
D

A and *B* divide their assets into 3 equal subshares

The Lone-Chooser Method



A



B

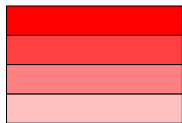


C

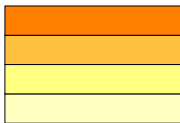
D

C chooses one subshare from each

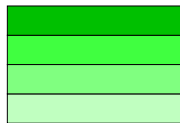
The Lone-Chooser Method



A



B

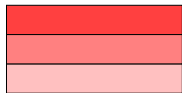


C

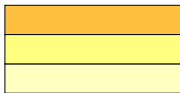
D

A, *B*, and *C* divide their assets into 4 equal subshares

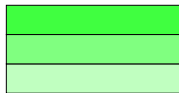
The Lone-Chooser Method



A



B



C



D

D chooses one subshare from each

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Example

Example (The Lone-Chooser Method – 3 Players)

- John, Joe, and Jim are dividing 4 pies: apple, cherry, lemon, and pecan.
- The value systems of the players are as follows.

	Apple	Cherry	Lemon	Pecan
John	12	6	10	8
Joe	7	2	8	4
Jim	6	4	2	6

- Jim is the lone-chooser.
- John and Joe use the divider-chooser method, with John the divider.

Example

Example (The Lone-Chooser Method – 3 Players)

- John divides into
 - Share 1 = Apple + Cherry (value 18).
 - Share 2 = Lemon + Pecan (value 18).
- Joe chooses Share 2 (value 12) over Share 1 (value 9).
- John gets Share 1.

Example

Example (The Lone-Chooser Method – 3 Players)

- Now John and Joe divide their shares each into 3 equal subshares.
- John's share, to be divided 3 ways and Jim chooses:

	Apple	Cherry
John	12	6
Jim	6	4

- Joe's share, to be divided 3 ways and Jim chooses:

	Lemon	Pecan
Joe	8	4
Jim	2	6

Example

Example (The Lone-Chooser Method – 3 Players)

- John divides Share 1 into subshares.
 - Subshare 1 = $\frac{1}{2}$ Apple (value 6).
 - Subshare 2 = $\frac{1}{2}$ Apple (value 6).
 - Subshare 3 = Cherry (value 6).
- Joe divides Share 2 into subshares.
 - Subshare 1 = $\frac{1}{2}$ Lemon (value 4).
 - Subshare 2 = $\frac{1}{2}$ Lemon (value 4).
 - Subshare 3 = Pecan (value 4).

Example

Example (The Lone-Chooser Method – 3 Players)

- Jim values John's subshares as follows.
 - Subshare 1 has value 3.
 - Subshare 2 has value 3.
 - Subshare 3 has value 4.
- Jim values Joe's subshares as follows.
 - Subshare 1 = has value 1.
 - Subshare 2 = has value 1.
 - Subshare 3 = has value 6.

Example

Example (The Lone-Chooser Method – 3 Players)

- Jim chooses Subshare 3 from John and Subshare 3 from Joe, for a value of 10.
- John is left with his Subshares 1 and 2, for a value of 12.
- Joe is left with his Subshares 1 and 2, for a value of 8.

Example

Example (The Lone-Chooser Method – 3 Players)

- What if Jim were the first divider, John the first chooser, and then Jim and John the subdividers and Joe the second chooser?
- What if Joe were the first divider, Jim the first chooser, and then Joe and Jim the subdividers and John the second chooser?
- In general, which role would you prefer to be in?

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Example

Example (The Lone-Chooser Method – 4 Players)

- John, Joe, Jim, and Jack are dividing 3 pies: apple, cherry, and lemon.
- Their value systems are as follows.

	Apple	Cherry	Lemon
John	12	6	6
Joe	4	8	4
Jim	6	8	6
Jack	9	8	3

- First, John divides into halves and Joe chooses.
- Second, John and Joe divide into thirds and Jim chooses.
- Finally, John, Joe, and Jim divide into fourths and Jack chooses.

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Assignment

- Chapter 3: Exercises 35, 36, 37, 38, 41, 42 (both editions).