# Review

## Lecture 39

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Hampden-Sydney College

Mon, Dec 5, 2016

1. The Exam
   - Test #2
   - Test #3

# Outline

# The Exam

- The exam will be held Tuesday, December 13, 9:00 am - 12:00 pm, in this room.

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- Be present and prepared.

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- I want to see who went back and learned the material.

# Outline

# The Exam – Test #2

- Test #2, # 3:] (60%) Find the Banzhaf power distribution of the weighted voting system $[6 : 6, 3, 3, 2]$. Show clearly all of your work.

# The Exam – Test #2

- Test #2, #5b: (65%) Roy and Troy will divide divide three cases of beer, Budweiser, Coors, and Michelob, between themselves. Their value systems are as follows:

| | Budweiser | Coors | Michelob |
|---|---|---|---|
| Roy | 16 | 12 | 20 |
| Troy | 12 | 12 | 18 |

(a) (4 pts) What is each player's fair share?
(b) (8 pts) Let Roy be the divider and apply the divider-chooser method. Describe precisely the shares that each player receives. State exactly what fraction or percent of the assets each player receives.

# The Exam – Test #2

- Test #2, #6ab: (64%) Gary, Harry, and Larry will divide four pies, Apple, Blueberry, Cherry, and Lemon, among themselves. Their value systems are as follows:

| | Apple | Blueberry | Cherry | Lemon |
|---|---|---|---|---|
| Gary | 4 | 10 | 2 | 8 |
| Harry | 1 | 6 | 6 | 5 |
| Larry | 4 | 3 | 8 | 6 |

We will use the lone-chooser method to divide the pies. In the first stage, Gary and Harry will divide the pies between the two of them, with Gary dividing and Harry choosing.

(a) (8 pts) Describe *precisely* the shares $s_1$ and $s_2$ into which Gary divides the pies.

(b) (2 pts) Which share does Larry choose?

In the second stage, they will divide their shares into subshares.

(a) (8 pts) Describe *precisely* the subshares into which Gary and Harry divide their shares.

(b) (2 pts) Which subshares does Larry choose? Be *very specific*.

(c) (4 pts) Summarize the division by summarizing precisely what each

# The Exam – Test #2

- Test #2, #6cde: (59%) Gary, Harry, and Larry will divide four pies, Apple, Blueberry, Cherry, and Lemon, among themselves. Their value systems are as follows:

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|---|---|---|---|---|
| Gary | 4 | 10 | 2 | 8 |
| Harry | 1 | 6 | 6 | 5 |
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# Outline

# The Exam – Test #2

- Test #2, # 7de: (59%) Arnie, Bernie, and Charlie are to divide three extremely rare coins among themselves. The coins are a 1909-S Lincoln cent, an 1885 Indian Head cent, and a 1902 Morgan dollar.

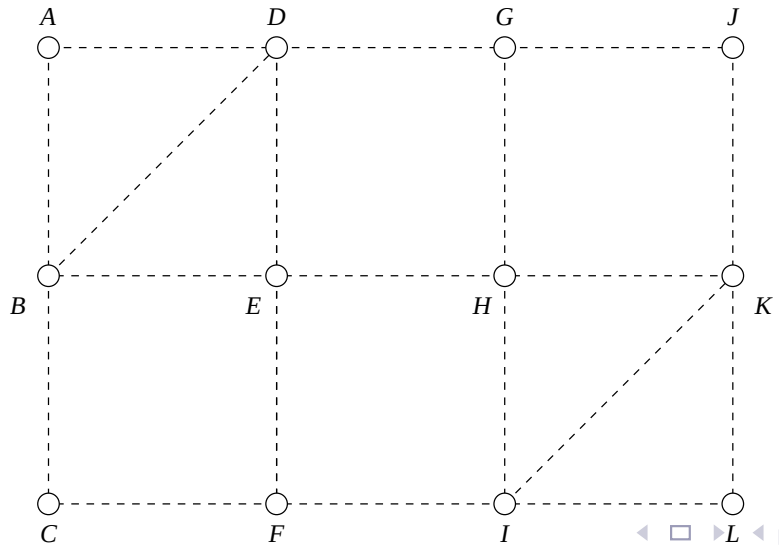
| | Lincoln Cent | Indian Head Cent | Morgan Dollar |
|---|---|---|---|
| Arnie | \$3000 | \$1500 | \$1200 |
| Bernie | \$3200 | \$1200 | \$1150 |
| Charlie | \$2500 | \$1350 | \$1400 |

We will use the method of sealed bids.

(a) (4 pts) Find each player's fair share.
(b) (4 pts) Tell who wins the various assets as a result of the bidding.
(c) (8 pts) Describe precisely the first settlement, including how much cash each player paid or received.
(d) (4 pts) What is the value of the surplus?
(e) (4 pts) Summarize *clearly* and *concisely* the final settlement.

# The Exam – Test #3

- Test #3, #4: (69%) Consider the graph shown below. Decide which of the following is appropriate, and then do it. (The edges are dotted so that you can tell which ones you have traced over.)
  - (i) If there exists an Euler circuit for the graph, then draw it, labeling the edges 1, 2, 3, . . . in order or list the vertices in the order visited.
  - (ii) If there does not exist an Euler circuit, but there does exist an Euler path, then draw it, labeling the edges 1, 2, 3, . . . in order or list the vertices in the order visited.
  - (iii) If there exists neither an Euler circuit nor an Euler path, then explain why.



# The Exam – Test #3

- Test #3, #5: (69%) Find an *optimal* eulerization for the following graph. The vertices represent street intersections and the squares represent city blocks, so you cannot draw diagonal edges; any new edges must represent retraveling an existing edge. In other words, if this were an instance of the Security Guard Problem, find a circuit with the fewest number of streets that the guard would have to walk twice to traverse all the streets at least once.