Good Afternoon, Colleagues

Are there any questions?

Peter Stone
Good Afternoon, Colleagues

Are there any questions?

- Can GT apply to the real world?
- Are there other GT programming contests?
- What if you don’t know outcomes ahead of time?
Logistics

- No more slack in the discussion schedule
Logistics

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- Two talks by Rob Holte
T-test vs. Paired T-test

- Is the right half of the class or the left half taller?
T-test vs. Paired T-test

- Is the right half of the class or the left half taller?
- Did you weigh less after the class than before?
T-test vs. Paired T-test

- Is the right half of the class or the left half taller?
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- Who’s better at pacman? Chinmay or Neil?
T-test vs. Paired T-test

- Is the right half of the class or the left half taller?
- Did you weigh less after the class than before?
- Who’s better at pacman? Chinmay or Neil?
- Who’s better at video games in general?
More Programming Competitions

- Repeat of IPD: multiple collaborative agents win
More Programming Competitions

- Repeat of IPD: multiple collaborative agents win
- RoShamBo: statistics vs. direct history
Game Theory

- Multiagent systems
- Economics
- Social science, law, etc.
Bach/Stravinsky

- My wife and I agree to meet at a concert
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Unfortunately, there are 2: Back and Stravinsky
Bach/Stravinsky

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- No time to get in touch with each other
Bach/Stravinsky

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- I prefer Stravinsky, she prefers Bach
Bach/Stravinsky

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• But most of all, we want to be together
Bach/Stravinsky

- My wife and I agree to meet at a concert
- Unfortunately, there are 2: Back and Stravinsky
- No time to get in touch with each other
- I prefer Stravinsky, she prefers Bach
- But most of all, we want to be together
- Propose a payoff matrix
<table>
<thead>
<tr>
<th></th>
<th>Wife</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>B</td>
</tr>
<tr>
<td>S</td>
<td>2,1</td>
</tr>
<tr>
<td>S</td>
<td>0,0</td>
</tr>
<tr>
<td>Me</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>0,0</td>
</tr>
<tr>
<td>B</td>
<td>1,2</td>
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Matching Pennies

- We each put a penny down covered
- If they match, I win, if they don’t, you win
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\[
\begin{array}{c|cc}
 & H & T \\
\hline
H & 1, -1 & -1, 1 \\
T & -1, 1 & 1, -1 \\
\end{array}
\]
Matching Pennies

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\begin{tabular}{c|cc|}
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\hline
H & 1,-1 & -1,1 \\
T & -1,1 & 1,-1 \\
\end{tabular}

Nash equilibrium?
### Mixed strategy equilibrium

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<tr>
<th>Player 1</th>
<th>Action 1</th>
<th>Action 2</th>
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<tbody>
<tr>
<td>Action 1</td>
<td>4,8</td>
<td>2,0</td>
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Player 1

- What if player 2 picks action 1 3/4 of the time?
## Mixed strategy equilibrium

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- What if player 2 picks action 1 3/4 of the time?
- What if player 2 picks action 1 1/4 of the time?
- Player 1 must be indifferent between actions 1 and 2
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- Player 2 must be indifferent between actions 1 and 2

Do actual numbers matter?