Let’s Get Together

Group 1
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Multiplayer Strategy

- Move in random diagonals to capture information
- Communication protocol:
  - Calculate what I see
  - Calculate what they see
  - Lower num moves onto higher num

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<th>5</th>
<th>3</th>
<th>6</th>
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<td>1</td>
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<td>2</td>
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<td>7</td>
<td>4</td>
<td>8</td>
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Player 1’s view of Player 2

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Player 2’s view of Player 1

- Deadlock detection
  - Timeout: 2 rounds, then I move
Single Player Strategy

- Gather player coordinates by laying down tracks
- Calculate areas
- Find meeting point in smallest area
- Shortest path to meeting point

- Multiplayer and Single player combination
Multiplayer Detection

- If we found some information before $2\times\text{min} + \text{max}$ rounds have elapsed.
- If we didn’t find at least one of a player’s coordinates during the last two revolutions.
- Worst case convergence time out $3\times\text{min} + 2\times\text{max}$ rounds.
Laying down tracks

- One revolution in the min direction
- One revolution in the max direction: search for one player coordinates
- Last revolution in the min direction: search for the other player coord.

- $2 \times \text{min} + \text{max steps}$
Minimum Areas

- Adjust coordinate system to determine direction of travel
- Choose minimum area among those created by any pair of players
- Compute center point of area and player offset
- Move diagonally to shorten distance traveled
Conflict Resolution

- Odd number distances result in “off by one” errors
- Two or more minimum areas
- Equidistant locations due to wrapping
Tournament Analysis

- Success Rate determined by comparing our score to the “Expected Score”

\[ 2.5 \times \text{min} + 1.5 \times \text{max} \]

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<thead>
<tr>
<th>Number of Players</th>
<th>Success Rate</th>
<th>Average Ranking</th>
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<tbody>
<tr>
<td>2</td>
<td>96%</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>90%</td>
<td>4</td>
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<tr>
<td>5</td>
<td>73%</td>
<td>6</td>
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<td>9</td>
<td>55%</td>
<td>10</td>
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