**Standard Tournament Strategies**

**1. Revlon Strategies**

* **RevlonAggressive:**
  + Focuses on dominating the market by defecting most of the time (not cooperating with competitors). It's a "take more, give less" strategy.
  + Example: Launching aggressive advertising campaigns to capture market share at the cost of others.
* **RevlonInnovative:**
  + Cooperates selectively and avoids constant defection. Innovates by cooperating after every two defections, aiming for a balance between risk and collaboration.
  + Example: Introducing groundbreaking products while maintaining some partnerships.
* **RevlonBroadDistribution:**
  + Aims for broad market coverage by cooperating unless the competitor defects multiple times in a row.
  + Example: Collaborating with distributors and retailers unless competitors start poaching clients.

**2. Estée Lauder Strategies**

* **EsteeLauderLuxury:**
  + Prioritizes cooperation unless the opponent defects excessively, emphasizing brand reputation and collaboration.
  + Example: Partnering with high-end brands to maintain exclusivity.
* **EsteeLauderSustainable:**
  + Cooperates most of the time (90%) but occasionally defects, reflecting an eco-conscious but competitive approach.
  + Example: Sustainable packaging while undercutting competitors' prices slightly.
* **EsteeLauderTargetedCampaigns:**
  + Defects when others cooperate but cooperates when facing constant defection, aiming to capitalize on specific scenarios.
  + Example: Launching targeted campaigns against competitors' loyal customers but collaborating during joint ventures.

**3. Adaptive Strategies**

* **Simpleton:**
  + Adapts its behavior based on the opponent's last move:
    - If the opponent cooperates, it copies its last move.
    - If the opponent defects, it does the opposite of its last move.
  + Example: Trust-building, but retaliating if betrayed.
* **TitForTat:**
  + Mimics the opponent's previous move, starting with cooperation.
  + Example: If the competitor cooperates, TitForTat cooperates in the next move. If the competitor defects, it defects next.

**Genetic Algorithm Strategies**

The **GeneticOneMove** strategy uses genetic algorithms to evolve and optimize behaviors. Each instance is initialized with weights and factors that define its tendencies.

**How It Works:**

1. **Initialization:**
   * Each strategy is assigned weights (e.g., 0.5 to 1.0) and factors (factorA, factorB), influencing decision-making.
   * Example: A strategy with weight 0.7 might lean more towards cooperation.
2. **Evolution:**
   * Poor-performing strategies are replaced by "mutated" versions of top performers.
   * Example: A strategy's weight might increase slightly (+0.1) or decrease (-0.1).
3. **Objective:**
   * Strategies aim to maximize performance by adapting to competitors' moves over multiple rounds.

**GeneticOneMove Behavior:**

* The strategy uses a combination of factors (A and B) and weights (W) to decide moves:
  + FactorA: Represents general behavior (e.g., risk-taking, consistency).
  + FactorB: Adds variability (e.g., random decision-making).
  + Weight: Influences the likelihood of cooperation.
* Example: A GeneticOneMove strategy with A=2, B=5, W=0.8 might:
  + Cooperate most of the time (W > 0.5).
  + Defect occasionally based on B.

**Methodology**

1. **Standard Tournament:**
   * Each strategy competes against all others over multiple rounds.
   * Points are awarded based on outcomes (e.g., mutual cooperation, exploitation).
2. **Genetic Algorithm:**
   * Top strategies are retained and mutated to explore better variants.
   * Focuses on optimization rather than direct competition.

**Key Insights**

From our implementation:

1. **Predefined Strategies:**
   * Balanced strategies like TitForTat and Simpleton perform well in cooperative environments.
   * Aggressive strategies like RevlonAggressive thrive in competitive setups.
2. **Genetic Strategies:**
   * The genetic algorithm produces diverse strategy variants but requires variability in weights and factors for distinct outcomes.
   * Top-performing genetic strategies often balance cooperation and defection effectively.
3. **Applications:**
   * Simulating marketing campaigns to understand the impact of different approaches.
   * Optimizing resource allocation in competitive business scenarios.