Case Study Report: Loyalty Point System Analysis for a Gaming Platform

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Assignment Type: Data Analyst Case Study
Tools Used: Python, Pandas, Jupyter Notebook

Objective

To analyze user activity on a real-money gaming platform and:

1. Calculate player-wise loyalty points.
2. Rank users based on engagement.
3. Propose a fair strategy to distribute a ₹50,000 bonus pool among top players.
4. Evaluate and improve the loyalty formula for better fairness.

Part A: Loyalty Points Calculation

We processed three datasets: **Deposits**, **Withdrawals**, and **Games Played**. Loyalty points were calculated using the company-provided formula:

```
Loyalty Points =
  0.01 * Deposit Amount +
  0.005 * Withdrawal Amount +
  0.001 * max(Deposit - Withdrawal, 0) +
  0.2 * Number of Games Played
```

- A flexible function was created to calculate loyalty points for any given **date** and **time slot** (S1: 12am–12pm, S2: 12pm–12am).
- Results were manually verified by checking individual user data for correctness.

Insights:

- Users with large deposits ranked highest.
- Highly active users with low deposits ranked lower, exposing imbalance in the formula.

Part B: Bonus Distribution Strategy

Task: Distribute ₹50,000 among the top 50 players ranked by loyalty points.

Strategy Chosen: Bonuses were distributed **proportionally to loyalty points**, as this metric considers deposits, withdrawals, and gameplay:

```
Bonus = (Player's Loyalty Points / Total Loyalty Points of Top 50) * 50000
```

This approach ensures that bonuses reflect total user engagement fairly.

Part C: Formula Evaluation and Suggested Improvements

Observed Issues:

- Withdrawal rewards encouraged undesired behavior.
- Deposit-heavy users ranked above highly engaged gamers.
- Flat game reward did not reflect session duration or consistency.

Suggested Improvements:

- Remove or reduce weight of withdrawals.
- Increase weight of gameplay and add a consistency metric (active days).
- Use a more balanced formula such as:

```
Loyalty Points =
  0.008 * Deposit Amount +0.001 * Withdrawal Amount +
  0.002 * Net Deposit +
  0.25 * Number of Games Played +
  2 * Active Days
```

Simulation: We implemented the improved formula and compared the leaderboard. It helped:

- Promote users with high game activity and consistency.
- Reduce bias toward large depositors with minimal activity.

Conclusion: While no formula is perfect, these changes encourage more balanced behavior and fairer reward distribution.

Skills Demonstrated

- Data wrangling with Pandas
- Writing reusable and testable functions
- User engagement analysis and ranking
- Strategy formulation and validation using simulations
- Real-world problem solving from both technical and business perspectives

Final Notes

This project highlights my ability to translate business problems into data solutions, validate them through analysis, and communicate insights clearly. The notebook contains all code and simulation steps.

Thank you for your time and consideration.

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