# Business Problem: Optimizing Betting Strategies and Identifying Patterns

**Overview:**

The company operates a gaming platform where users place bets on various games. Players can place bets on different game types (e.g., slot machines, poker, etc.), with varying bet amounts and potential winnings. The company's goal is to **optimize betting strategies**, improve user retention, and boost profitability by analyzing player behavior, betting patterns, and win-loss ratios.

**Key Questions and Insights to Gain:**

1. **Player Behavior Analysis:**
   * **What are the most popular games among players?**
   * **What is the average bet amount per game type?**
   * **How often do players bet, and what are their typical betting patterns?**
   * **What is the relationship between the player's age, country, and the game type they choose?**
2. **Betting Patterns and Game Performance:**
   * **How often do players win versus lose, and how much do they typically win or lose per bet?**
   * **Which game types are more profitable for the platform (i.e., higher bet amounts and higher win amounts)?**
   * **Are there any noticeable trends in bet amounts and win amounts based on time (e.g., time of day, days of the week)?**
3. **User Retention and Engagement:**
   * **What is the average lifespan of a player (from registration to when they stop betting)?**
   * **Can we identify players who are likely to churn based on their betting behavior (e.g., sudden decrease in bet amount or frequency of betting)?**
   * **How can we target different player segments with personalized promotions or incentives?**
4. **Game Optimization and Fairness:**
   * **Are there certain game types or bet structures that tend to lead to player losses more often than others?**
   * **Do certain players consistently win higher amounts, and if so, what strategies can be implemented to balance game fairness?**
   * **How can we adjust odds or game mechanics to maximize engagement while maintaining fairness and profitability?**

**Potential Actions to Take Based on Insights:**

* **Personalized Player Experience**: By analyzing individual player behavior, the company can tailor recommendations for game types, bonuses, and promotions. For example, if a player bets frequently on a specific type of game, the system could recommend new games with similar mechanics or provide them with targeted bonuses.
* **Targeted Marketing and Retention Strategies**: If certain patterns (e.g., decreased bet amounts or fewer bets) are linked to players who are likely to churn, marketing campaigns can be launched to re-engage these users with bonuses or promotions. Identifying high-value, loyal players can help with creating exclusive rewards.
* **Improve Game Design and Fairness**: Analyzing betting patterns across game types can help identify games that might be too difficult or too easy for players, leading to changes in game mechanics. For example, if a game has too many losses for players, the company can adjust the odds to balance the experience.
* **Increase Profitability through Optimized Betting Models**: By analyzing bet amounts and win-loss ratios, the company can identify which games are most profitable and which ones need adjustments. Additionally, by studying when players are most active, the company can optimize game availability and marketing efforts to boost revenue during peak times.

# CONCEPTUAL DATA MODEL

## Entities and attributes (What do I need to extract from the database):

In this case we have fake data, but if I would extract the data from the database, I would need to perform a deeper analysis to create the tables from the available data, for example:

*The database would return the Age and device of the player in the bets table, but this would be redundant with the Players table, so I would not include this in the SQL query for BETs, to ensure that we keep max performance by getting just necessary data.*

*In the case of a real business case would need to talk more to the business to identify as well possible entities and attributes that were not clear.*

*For example in Bets instead of choosing Game Type, we can use game ID and then get all the information from the game from the other table (Normalization).*

1. Players:
   1. ID
   2. Registration date
   3. Country
   4. Age
   5. Device
2. Bets
   1. ID
   2. Player ID (FK)
   3. Bet time
   4. Game ID
   5. ~~Game Type~~
   6. Bet Amount
   7. Win Amount
3. Transaction
   1. ID
   2. Player ID (FK)
   3. Transaction time
   4. Transaction type
   5. Amount
   6. Method
4. Sessions
   1. ID
   2. Player ID (FK)
   3. Start time
   4. End Time
   5. Bet amount
   6. Win Amount
5. Games
   1. ID
   2. Game Type
   3. Provider
   4. Evolution
   5. Volatility
   6. Release date
   7. RTP
6. Campaign
   1. ID
   2. Player ID (FK)
   3. Game ID (FK)
   4. Name
   5. Reward
   6. Assigned at
   7. Redeemed

Relationships:

* Player does a transaction
* Player does a bet
* Player Logs in a session
* Player uses/receives a campaign
* A Bet occurs in one Game
* A campaign is given to an specific game

# LOGICAL MODEL

## Entities (tables) and attributes (columns)

1. Players:
   1. PLAYER\_ID (INT – PRIMARY KEY)
   2. Registration date (DATE – TIME)
   3. Country (TEXT)
   4. Age (INT)
   5. Device (TEXT)
2. Bets
   1. Bets\_ID (INT – PRIMARY KEY)
   2. Player ID (INT – FOREIGN KEY)
   3. Bet\_time (DATE -TIME)
   4. Game\_ID (INT – FOREIGN KEY)
   5. Bet\_Amount (FLOAT)
   6. Win\_Amount (FLOAT)
3. Transaction
   1. Transaction\_ID ( INT – PRIMARY KEY)
   2. Player ID (INT – FOREIGN KEY)
   3. Transaction time (DATE -TIME)
   4. Transaction type (TEXT)
   5. Amount (FLOAT)
   6. Method (FLOAT)
4. Sessions
   1. Session\_ID ( INT – PRIMARY KEY)
   2. Player ID (INT – FOREIGN KEY)
   3. Start time (DATE -TIME)
   4. End Time (DATE -TIME)
   5. Bet amount (FLOAT)
   6. Win Amount (FLOAT)
5. Games
   1. Games\_ID ( INT – PRIMARY KEY)
   2. Game Type (TEXT)
   3. Provider (TEXT)
   4. Volatility (TEXT)
   5. Release date (DATE )
   6. RTP (FLOAT)
6. Campaign
   1. Campaign\_ID ( INT – PRIMARY KEY)
   2. Player ID (INT – FOREIGN KEY)
   3. Game\_ID (INT – FOREIGN KEY)
   4. Name (TEXT)
   5. Reward (FLOAT)
   6. Assigned at (DATE -TIME)
   7. Redeemed (BOOLEAN)

Relationships of Foreign Keys:

* Player does a transaction (One to Many)
* Player does a bet (One to Many)
* Player Logs in a session (One to Many)
* Player uses/receives a campaign (One to Many)
* A Bet occurs in one Game (Many to One)
* A campaign is given to an specific game (Many to One)