**Technical Assignment for the Final Project**

**General Requirements:**

The final project must include:

* A presentation,
* A script of the code confirming the obtained results,
* Additional files generated during the task execution.

**Task Description:**

The dataset contains raw data from a gaming company specializing in match-3 puzzle games. The game's objective is to match three (or more) identical figures on the board to remove them, ultimately clearing the board of all initial figures.

**Game Structure:**

1. **Locations by Difficulty Levels:**
   * **Bronze**, **Silver**, and **Gold**.
   * Each location consists of **chapters**, with **100 chapters per location**.
   * Each chapter includes **5 games**.
   * The final game in each chapter is typically more challenging and awards a corresponding **trophy** upon completion.
2. **Objective:**
   * Progress through all locations and collect all trophies.
3. **Player Progression:**
   * For every completed level, the player's level increases by **1**.
   * Players earn a certain amount of **gold**, which can be spent in the in-game shop.
4. **Additional Resources for Level Completion:**
   * **Hammer**, **Dynamite**, and **Bomb** can be purchased using gold or real money.
5. **Game Tokens:**
   * Tokens are required to start playing a game.
   * Tokens can be accumulated or acquired in several ways:
     + **Daily chests**:
       - Free chest: provides **10 tokens daily**.
       - Subscription chest: provides **5 tokens daily** (available for opening once per day, resets at midnight). Upon the first subscription purchase, tokens are granted immediately.
     + Tokens can also be purchased in the shop using **gold** or **real money**.

**Variant 2**

1. **Data Preparation:**
   * Extract data from the oplogs table and distribute it across three new tables according to the specified schemas.
   * Before the transfer, remove potential duplicates and calculate any missing parameters as required.
2. **Metrics System Development:**
   * Develop a system of metrics to analyze:
     + **Revenue** from users,
     + **Conversion rates**,
     + **Purchase structure**.
   * Create dashboards that enable real-time tracking of metric changes and support decision-making based on these metrics.
   * Provide conclusions and actionable recommendations based on the insights.
3. **A/B Testing Analysis:**
   * Analyze the results of an A/B test aimed at evaluating whether to reduce the difficulty of **Level 2 in Chapter 1**.
   * Experiment details:
     + Test period: **February 3, 2023 – February 10, 2023**.
     + **Group A**: Users whose user\_id ends with 0, 1, 2, 3, 4.
     + **Group B**: Users whose user\_id ends with 5, 6, 7, 8, 9.
   * Provide an assessment of the experiment's outcomes, determine whether the difficulty should be reduced, and justify your conclusions.

- Source Data: **oplogs** Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Data Type** | **Required** | **Description** |
| **platform\_type** | *String* | Yes | Player Platform Type |
| **user\_id** | *String* | Yes | Internal Player ID |
| **session\_id** | *String* | Yes | Player Session ID |
| **user\_time** | *DateTime* | Yes | Event Timestamp |
| **country** | *String* | Yes | Two-letter Country Code |
| **version** | *String* | Yes | Application Version |
| **event\_name** | *String* | Yes | Event Name |
| **param\_1** | *Float64* | No, depends on the event | Event Parameter 1 |
| **param\_2** | *Float64* | No, depends on the event | Event Parameter 2 |
| **extra\_1** | *String* | No, depends on the event | Event Parameter 1 Description |
| **extra\_2** | *String* | No, depends on the event | Event Parameter 2 Description |
| **level** | *UInt16* | Yes | Player Level at Event Time |

- Source Data with Event Names and Trigger Conditions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **event\_name** | **Description** | **Trigger Condition** | **param\_1** | **param\_2** | **extra\_1** | **extra\_2** |
| **app\_install\_start** | *Application Installation Start* | *Application Installation Launch* | Player Acquisition Cost |  | Traffic Type: **paid/organic** |  |
| **app\_install\_finish** | *Application Installation Completion* | *First Launch of Installed Application* | Installation Duration in Seconds |  |  |  |
| **loading\_finish** | *Application Download Completion* | *Loading of Application's Start Screen* | Loading Duration in Seconds |  |  |  |
| **error\_window** | *Application Error* | *Error Window with "Reload" Button Displayed* | Error Code |  | Error Name |  |
| **performance** | *Specifications* | *During Application Installation* | Average FPS Value |  | Device Vendor Name | Device Model Name |
| **tutorial\_step\_start** | *Tutorial Step Start* | *Start of Tutorial Step* | Tutorial Step Number |  |  |  |
| **tutorial\_step\_finish** | *Tutorial Step Completion* | *Completion of Tutorial Step* | Tutorial Step Number |  |  |  |
| **lvl\_up** | *New Player Level* | *Level Up* | Player Level After Level Up |  |  |  |
| **purchase** | *Player Resource Purchase* | *Player Purchase Confirmation, Deduction of Funds in Case of Real Money* | Purchase Type: 0 – Using Gold; 1 – Using Real Money | Purchase Cost | Purchase Source: **subscription,**  **shop,**  **offer** | Purchase Offer ID |
| **res\_movement\_inc** | *Player Resource Collection* | *Upon Any Resource Acquisition* | Resource Quantity | Resource Quantity After Change | Resource Name | Resource Acquisition Source |
| **res\_movement\_outc** | *Player Resource Spend* | *Upon Any Resource Spend* | Resource Quantity | Resource Quantity After Spend | Resource Name | Resource Spend Source |
| **stage\_start** | *Start of Campaign Level Completion* | *Campaign Level Start* | Campaign Level Number | Campaign Chapter Number | Location Type: **bronze\_loc, silver\_loc, gold\_loc** |  |
| **stage\_win** | *Successful Completion of Campaign Level* | *Successful Completion of Campaign Level* | Campaign Level Number | Campaign Chapter Number | Location Type: **bronze\_loc, silver\_loc, gold\_loc** | Trophy Awarded for Final Level in Chapter: **Bronze\_cup, Silver\_cup, Gold\_cup** |
| **stage\_lesion** | *Unsuccessful Completion of Campaign Level* | *Unsuccessful Completion of Campaign Level* | Campaign Level Number | Campaign Chapter Number | Location Type: **bronze\_loc, silver\_loc, gold\_loc** |  |
| **chest\_open** | *Chest Opening* | *Chest Opening and Resource Acquisition* | 0 – Regular Chest; 1 – Subscription Chest |  |  |  |

- Build a table with user data **user\_info**:

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Data Type** | **Description** |
| **platform\_type** | *String* | Player Platform Type |
| **user\_id** | *String* | Internal Player ID |
| **country** | *String* | Two-letter Country Code at Application Installation |
| **first\_version** | *String* | Version at the Time of Application Installation |
| **last\_version** | *String* | Application Version at the Time of Last Event for the Player |
| **type\_trafic** | *String* | Traffic Type: Paid/Organic |
| **first\_time** | *DateTime* | Application Installation Start Time |
| **last\_time** | *DateTime* | Time of Player's Last Event |
| **dates** | *Array(Date)* | Array of Dates When the Player Was Active |
| **payer** | *UInt8* | If the player has made at least one payment (including subscriptions), the payer status is 1; if there were no payments, the non-payer status is 0. |
| **total\_revenue** | *Float64* | Total Amount of All Player Payments |
| **max\_level** | *UInt16* | Player Level at the Time of Sending the Last Event |
| **amount\_gold** | *UInt32* | Amount of Gold in Player's Account at the Time of Sending the Last Event |
| **amount\_bronze\_cup** | *UInt16* | Number of Bronze Trophies in Player's Account at the Time of Sending the Last Event |
| **amount\_silver\_cup** | *UInt16* | Number of Silver Trophies in Player's Account at the Time of Sending the Last Event |
| **amount\_gold\_cup** | *UInt16* | Number of Gold Trophies in Player's Account at the Time of Sending the Last Event |

- Build a table with data on user sessions **user\_session**:

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Data Type** | **Description** |
| **platform\_type** | *String* | Player Platform Type |
| **user\_id** | *String* | Internal Player ID |
| **session\_id** | *String* | Player session ID |
| **version** | *String* | Version during the player's session |
| **session\_number** | *UInt16* | Session sequence number |
| **time\_start\_session** | *DateTime* | Session start time (when the **loading\_finish** event occurred) |
| **time\_finish\_session** | *DateTime* | Session end time (time of the player's last recorded event in the session) |
| **length\_session** | *UInt32* | Session duration in seconds |
| **amount\_get\_level** | *UInt16* | Number of levels gained by the player during the session |
| **amount\_get\_gold** | *UInt32* | Amount of gold earned by the player during the session |
| **amount\_get\_bronze\_cup** | *UInt16* | Number of bronze trophies earned by the player during the session |
| **amount\_get\_silver\_cup** | *UInt16* | Number of silver trophies earned by the player during the session |
| **amount\_get\_gold\_cup** | *UInt16* | Number of gold trophies earned by the player during the session |

- Build a table with data on user payments: **user\_payments**:

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Data Type** | **Description** |
| **platform\_type** | *String* | Player platform type |
| **user\_id** | *String* | Internal player ID |
| **session\_id** | *String* | Player session ID |
| **version** | *String* | Version during the player's purchase |
| **purchase\_number** | *UInt16* | Purchase sequence number |
| **purchase\_time** | *DateTime* | Purchase timestamp |
| **item** | *String* | Player's purchase location |
| **offer\_id** | *String* | Purchase offer ID |
| **price** | *Float64* | Purchase cost |
| **level** | *UInt16* | Player's level at the time of purchase |