Milestone 9 | GameJet Transactions

INTRODUCTION: In order to make the most of a given dataset, you may need to perform engineering of additional calculated fields. Performing calculations to transform the data lets an analyst extract new information that could not be obtained from the data as originally stored.

HOW IT WORKS: Follow the prompts in the questions below to investigate your data. Post your answers in the provided boxes: the **yellow boxes** for the queries you write, and **blue boxes** for text-based answers. When you're done, export your document as a pdf file and submit it on the Milestone page – see instructions for creating a PDF at the end of the Milestone.

RESOURCES: If you need hints on the Milestone or are feeling stuck, there are multiple ways of getting help. Attend Drop-In Hours to work on these problems with your peers, or reach out to the HelpHub if you have questions. Good luck!

PROMPT: In this Milestone, you'll help a mobile game company summarize and describe some general patterns in the app usage and spending for one of their games. Revenue from this game is supported by a traditional microtransaction model, where users can spend real money on in-app purchases for items that allow players to access more game features.

Monetization is a difficult problem for companies in the mobile games space, and they need to balance converting as many users from free users to paid users, without being so aggressive that they actually end up driving away more users and actually make less revenue. But before they can start developing strategies for improving the game from a business perspective, the team needs your help to summarize what has been done so far!

SQL App: Here's that link to our specialized SQL app, where you'll write your SQL queries and interact with the data.

– Data Set **Description**

The data for this Milestone (**`game_jet.*`**) describes activity for users of a mobile-based game with microtransactions. In the game, two currencies called 'passes' and 'gems' are used to unlock more game content and to purchase cosmetic items. These currencies can be earned slowly over regular play, but gems can also be purchased as in-app purchases. You will be working with three tables in this Milestone: `users`, `sessions`, and `iaps`.

The `users` table lists users who have downloaded the game app, one per row. The table contains six columns, of which include:

- **`udid`** - unique id for the user / device
- **`install_date`** - date of user installing the app
- **`Lang`**- two-letter code for native language for device
- **`country`** - two-letter code for user's country

The `sessions` table records every session taken by a user where they opened the app. There are four columns in this table:

- **`udid`** - user / device id
- **`ts`** - timestamp for start of session
- **`date`** - pre-truncated date for session
- **`session_num`** - cumulative session number for the user

The `iaps` (In-app purchases) table records all purchases made by users, exchanging real money for in-game currency. There are six columns in this table:

- **`udid`** - user / device id
- **`ts`** - timestamp for purchase
- **`date`** - pre-truncated date for session
- **`prod_type`** - product type, can be gems, passes, or a value pack.
- **`prod_qty`** - quantity code that is proportional to each product (e.g. a quantity of 1 for gems might actually represent 10 gems)
- **`rev`** - revenue / price of the purchase, in cents

– **Task 1:** App usage behaviors

How long does a user spend with the app in terms of the number of sessions or the days that they stick with the app? This can have implications for how much time we have to 'hook' a player and give them a reason to spend money on the app.

A. Query the `users` data table to discover the total number of users represented in the data.

```
SELECT
COUNT(udid) AS total_number_of_users
FROM game_jet.users
```

The total number of users represented in the data is 22576 users.

B. Next, write a query to count the number of distinct users in the sessions data table. Recalling your answer from Task 1A, how many users downloaded the app but didn't actually open it? HINT: A user who downloaded the app will always add a tally in the users table, but won't show up in sessions if they never use the app.

```
SELECT
COUNT(DISTINCT udid) AS
total_number_of_users_that_opened_the_app
FROM game_jet.sessions
```

The number of users that downloaded and opened the app is 22544 users. 32 users downloaded the app, but didnt use it.(22576-22544) = 32

C. Write a query that returns the number of sessions made by each user. Sort the output by the number of sessions made, from largest to smallest. How many sessions did the user with the most sessions have with the app?

```
SELECT
udid,
COUNT (session_num) AS number_of_sessions_made
FROM game_jet.sessions
GROUP BY udid
ORDER BY number_of_sessions_made DESC
```

The user with the most sessions had 1939 sessions.

D. We should also be interested in how many sessions were taken by a 'typical' app user. The average number of sessions with the app is 32.1. Modify your query from part C to only return users who have made more than that many sessions. How many users are there? (Read this from the SQL app interface.) Based on that number, how well does the average represent a 'typical' player? HINT: Your query should include the HAVING keyword here!

```
SELECT
udid,
COUNT (session_num) AS number_of_sessions_made
FROM game_jet.sessions
GROUP BY udid
```

```
HAVING COUNT (session_num) > 32.1
ORDER BY number_of_sessions_made DESC
```

The amount of users that has had more than 32.1 sessions is 5262 users.

— **Task 2:** In-App Purchases

How large is our user base in terms of who is spending money? Is it a lot of users spending a little, or is it a few users who are spending a lot? Different types of users will likely be responsive to different types of tactics to get them to spend more money.

A. Using the `iaps` table, write a query to determine the number of users who have made at least one purchase. Remember that each time a user makes a purchase, a new row is added to the `iaps` table.

```
SELECT
COUNT (DISTINCT udid) AS number_of_users_that_spent_money
FROM
game_jet.iaps
```

B. Both tables share values in the **`udid`** column. Write a query that left joins the `iaps` table to the `users` table and returns the total (sum) amount of money spent on in-app purchases, grouped by user id. Your query should return every user in the users table, regardless of whether or not the user made a purchase; the total spent for users with no record in the `iaps` table should be a *`null`* value.

```
SELECT
users.udid,
SUM(rev) AS total_amount_of_money_spent_on_game
FROM game_jet.users
LEFT JOIN game_jet.iaps
ON users.udid = iaps.udid
GROUP BY users.udid
ORDER BY total_amount_of_money_spent_on_game DESC
```

The total amount of money that was spent on in app purchases in the game by one user is 77410 cents or 771 dollars.

C. Modify your query in part B to create a new feature called persona that segments users into four purchasing personas:

- a "free player" who does not spend any money on in-app purchases,
- a "minnow" who spends less than $20 on in-app purchases,
- a "dolphin" who spends between $20 and $100 on in-app purchases,
- and a "whale" who spends at least $100 on in-app purchases.

Remember: revenue is recorded in terms of cents, so $20 is equal to 2000 cents and $100 is equal to 10 000 cents.

```
SELECT
```

```
users.udid,
SUM(iaps.rev) AS total_amount_of_money_spent_on_game,
CASE
WHEN SUM(iaps.rev) IS NULL THEN 'free player'
WHEN SUM(iaps.rev) < 2000 THEN 'minnow'
WHEN SUM(iaps.rev) >= 2000 AND SUM(iaps.rev) < 10000 THEN
'dolphin'
ELSE 'whale'
END AS persona
FROM game_jet.users
LEFT JOIN game_jet.iaps ON users.udid = iaps.udid
GROUP BY users.udid
ORDER BY total_amount_of_money_spent_on_game DESC
```

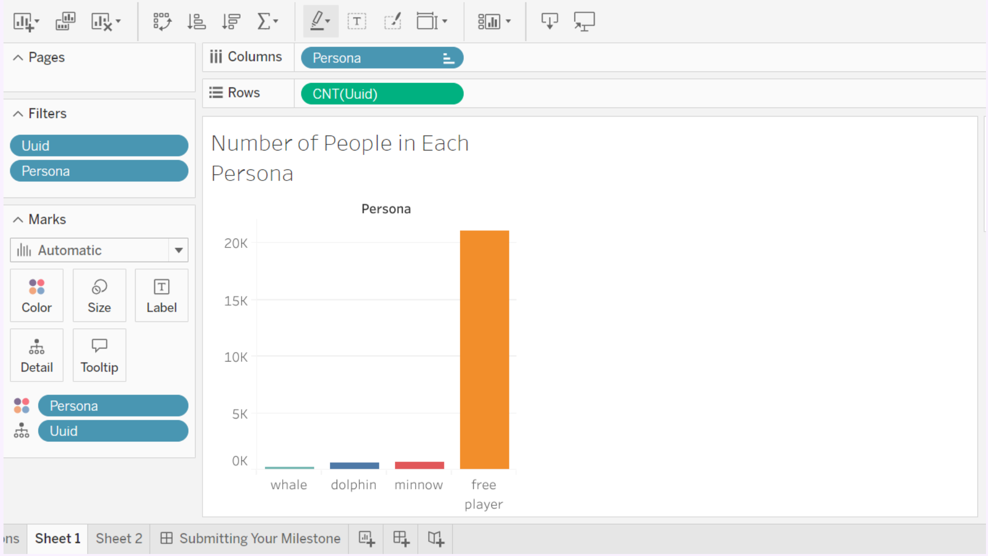
– **Task 3:** Analyzing Free-to-Play Personas

The remainder of this Milestone will be completed in a Tableau Workbook where we can use visualizations to aid in our analysis. Click this link **to navigate to the workbook you'll use to complete the remainder of this Milestone.** Once you've published your Tableau Workbook in the folder named Upload Workbooks Here, paste the Share Link in the box below.

https://prod-useast-b.online.tableau.com/t/globaltech/views/milestone9_16874223233860/Sheet3

Continue to post your answers in the provided boxes: purple boxes for your visualizations, and blue boxes for text-based answers.

A. On Sheet 1, create a bar chart to illustrate the total number of each purchasing persona. Which persona accounts for the majority of users?



Columns: Persona

Rows: CNT(Uuid)

Filters: Uuid, Persona

Marks: Automatic

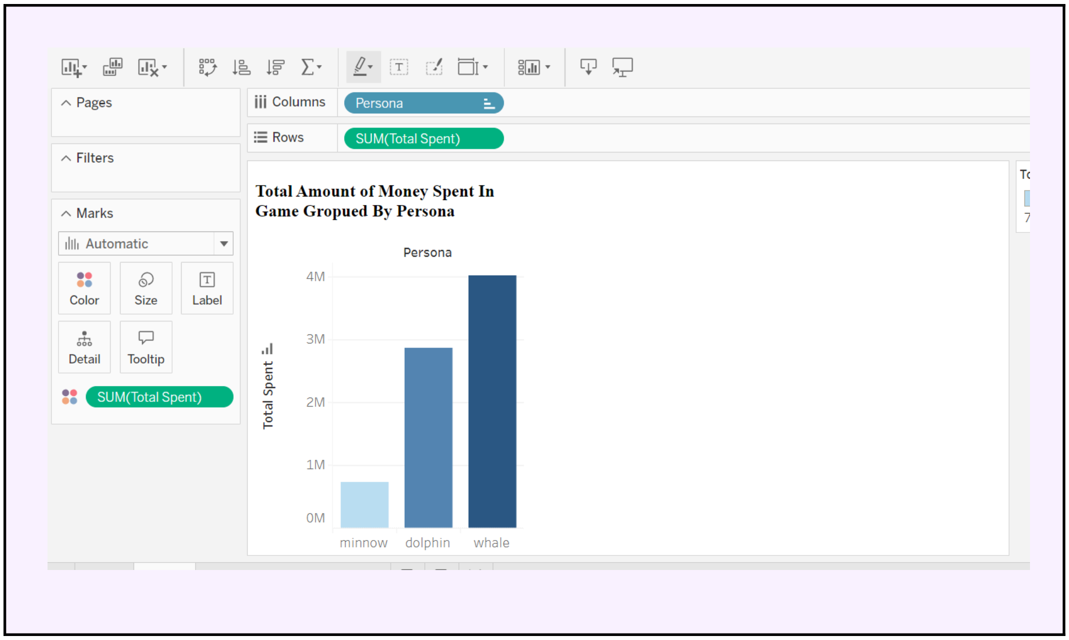
Color: Persona

Detail: Uuid

Number of People in Each Persona

The persona that has the greatest number of users is Free players, having more than 20k users.

B. On Sheet 2, create a second bar chart to illustrate the total amount of money spent, grouped by each purchasing persona. Since free players don't spend any money on in-app purchases, filter your visualization to show only the total revenue generated by minnows, dolphins, and whales. Which persona accounts for the majority of in-app purchase revenue?



Columns: Persona

Rows: SUM(Total Spent)

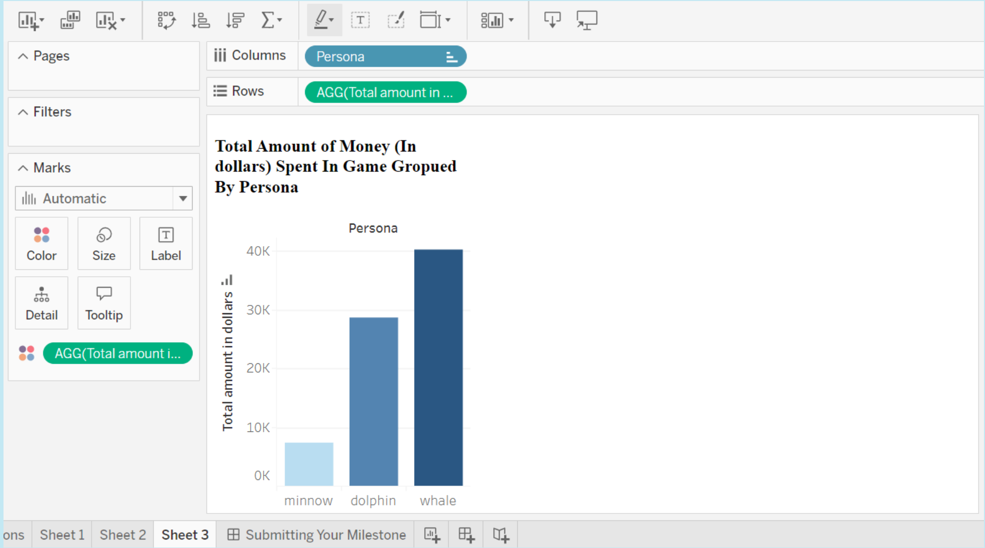
Marks: Automatic

SUM(Total Spent)

Total Amount of Money Spent In Game Gropued By Persona

The persona that accounts for the majority of in app purchases is the Whale, spending over 4,000,000 cents.

C. **Level Up**: You might notice in this last graph that your y-axis is pushing 4 000 000! But the units are cents, not dollars! Can you create a calculated field in your Tableau workbook that converts the total amount spent from cents to dollars and use this field to adjust your visualization? HINT: $1 = 100 cents.



Columns Persona

Rows AGG(Total amount in ...

Marks Automatic

AGG(Total amount i...

For my calculated field, I used SUM(total spent)/100 to convert the cents to dollars.

— Level Up

The answers to the questions in the Milestone tasks above should paint a picture of the game app being mostly supported off of a relatively small, dedicated group of players. Most users only engage with the app for a short amount of time and end up not buying anything. Even a fair amount of users who do buy something don’t make too many purchases.

Another angle of attack you might be interested in looking at is how long it takes for a user to make their first purchase, if they make any. You can do this in two steps. First, take the difference between the user’s install date and the date of each purchase they made to get the amount of days between when they started playing, and when they made a purchase. Their first purchase will then be the purchase with the smallest difference in dates. How many users make a purchase on the first day they have the app? Are there any other periods where we could possibly entice game players to make purchases?

```
SELECT
CASE
WHEN DATE_PART('day', iaps.date) - DATE_PART('day',
users.install_date) = 0 THEN 'First Day'
ELSE 'Other Periods'
END AS purchase_period,
COUNT(*) AS num_users
FROM game_jet.users
LEFT JOIN game_jet.iaps ON users.udid = iaps.udid
GROUP BY purchase_period
```

The amount of users that made in app purchase on the first day is 1793 users.I would assume that the best time to entice players to make a purchase is a couple of days or weeks.

– Submission

Great work completing this Milestone! To submit your completed Milestone, you will need to download / export this document as a PDF and then upload it to the Milestone submission page. You can find the option to download as a PDF from the File menu in the upper-left corner of the Google Doc interface.