A business in our Yelp data set can be classified as either a ‘Popular‘ or ‘Successful business’. Popular businesses are businesses that seem to attract more customers compared to other businesses in the same category and Successful businesses are ones that have been serving the community for a long time and which have loyal customers.
To define the metrics for classifying a business as a ‘Popular business’ we can measure the popularity of the business by the number of reviews it has received. A high number of reviews generally indicates a more popular business. We can use the ‘review_count’ column in the ‘Business’ table to calculate this metric. We can also consider the average rating of the business as an indicator of popularity. Businesses with higher average ratings are more likely to be more popular. We can then use the ‘stars’ column in the ‘Business tables’ to calculate the average rating.

A popular business can be calculated using SQL queries. Here is an example on how we might measure the metrics of a popular business:

```
SELECT *
FROM Business
WHERE review_count > 100 -- Set a threshold for the minimum number of reviews to consider a business as popular
  AND stars > 4.0 -- Set a threshold for the minimum average rating to consider a business as popular
```

To calculate the number of popular businesses in the *same* category, we can use this query as example:

```
SELECT category, COUNT(*) AS num_popular_businesses
FROM Business
WHERE review_count > (
  SELECT AVG(review_count)
  FROM Business
  WHERE category = Business.category
)
GROUP BY category;
```

In this query, we calculate the average review count for businesses in each category using a subquery (SELECT AVG(review_count) FROM Business WHERE category = Business.category). Then, we compare the review count of each business against the average for its category (WHERE review_count > ...). If a business has a higher review count than the category average, it is considered popular.

By grouping the results by the category column and applying the COUNT(*) function, we can calculate the number of popular businesses in each category (num_popular_businesses).

For a successful business, we can define the metrics by calculating the longevity and the number of loyal customers a business has. To measure the longevity we can use the earliest review date as a proxy for the business's start date. This can be used to determine the longevity and classify the businesses as successful based on their duration of operation.

Here's an example query to classify businesses as successful based on the earliest review date:

```
SELECT Business.business_id, Business.name, MIN(Reviews.review_date) AS
earliest_review_date
        FROM Business
        JOIN Reviews ON Business.business_id = Reviews.business_id
        GROUP BY Business.business_id, Business.name
        HAVING EXTRACT(YEAR FROM NOW()) - EXTRACT(YEAR FROM
MIN(Reviews.review_date)) >= 10;
```

In this query, we join the Business and Reviews tables based on the business_id column. We calculate the minimum (earliest) review date for each business using the MIN(Reviews.review_date) function. The HAVING clause filters the results to include only businesses that have been operating for 10 or more years (you can adjust the threshold as needed).

This query assumes that the Reviews table has a review_date column to store the date of each review. Modify the column names and adjust the query to match your specific schema.

We can then identify the number of loyal customers by considering the number of check-ins made by customers as an indicator of loyalty. The 'num_checkins' column in the 'Business' table or the 'CheckIn' table can be used to calculate this metric. Here's an example query:

```
SELECT *
        FROM Business
        WHERE  num_checkins > 1000 -- Set a threshold for the minimum number of check-ins
to consider a business as successful
```