

We are using two metrics to determine whether or not a business is successful. One metric is the businesses that have higher than average total check-ins while also having higher than average ratings. This metric is going to be used to find the businesses that are popular and have the highest foot traffic with above average check-ins along with the businesses that are successful as well, with high ratings. This approach helps us identify which businesses stand out in their communities. The other metric we are using is the businesses that have a 33% or higher average monthly review count increase. This metric determines if the business is bringing in more customers year-over-year. When a business is successful and popular it is able to bring in more customers every year and we set the threshold at 33% more reviews per year on average for a popular and successful business. We believe this growth indicates a thriving business.

To find the average total check-ins for each business category we joined the business, categories and check-ins tables. After that, we took the average number of check-ins for each business category and we averaged the amount of stars for each business category as well. Since lots of businesses had multiple categories, we had to keep only one category per business so that it could not be above average in some categories and below average in others. To do that we grouped the businesses by their ID, then by their category name and just kept the minimum value of the category name to make it only one category per business. After that we selected the businesses that had higher values for the stars and check-ins than the average for their category. A business is considered successful and popular if it is included in this query. If it is above

average in ratings then it is a successful and well-renowned business. If it is above average in check-ins then it is a popular business. This method allows us to gauge both the popularity and quality of businesses. So, if a business is above average in both check-ins and ratings, then it is a popular and successful business.

Our second metric we used to measure how businesses are doing over time. We looked at how many more reviews they got each month. First, we counted the reviews for each business for every month. Then, we compared this number to the reviews from the month before to see how much it grew. We were especially interested in businesses that had a big increase in reviews, showing they're getting more popular. We set a target growth rate and looked for businesses that were growing faster than this rate. This measure helps us identify businesses that are gaining momentum. This helped us find businesses that are not just doing well but are actually becoming more popular over time. We grouped these findings by business name and ID, focusing on those with a higher than 0.329 growth rate in their monthly reviews. This rate showed us which businesses were really standing out by attracting more customers. Businesses that exceed this growth rate are clearly capturing the public's interest. Businesses above this rate are considered successful because they're getting more attention and positive feedback from customers.

(Returns the businesses with higher than average checkins and stars for their category)

```
WITH CategoryAverages AS (
  SELECT
    cat.cat_name,
    AVG(ch.count) AS avg_checkins,
    AVG(b.stars) AS avg_stars
  FROM
    Checkins ch
    JOIN Categories cat ON ch.business_id = cat.business_id
    JOIN Business b ON ch.business_id = b.business_id
  GROUP BY
    cat.cat_name
),
FirstCategoryPerBusiness AS (
  SELECT
    b.business_id,
    b.name,
    MIN(cat.cat_name) AS first_category
  FROM
    Business b
    JOIN Categories cat ON b.business_id = cat.business_id
  GROUP BY
    b.business_id,
    b.name
),
BusinessCheckins AS (
  SELECT
    ch.business_id,
    SUM(ch.count) AS total_checkins
  FROM
    Checkins ch
  GROUP BY
    ch.business_id
),
BusinessWithFirstCategoryAndCheckins AS (
  SELECT
    fc.business_id,
    fc.name,
    fc.first_category,
    b.stars,
    bc.total_checkins
  FROM
    FirstCategoryPerBusiness fc
    JOIN BusinessCheckins bc ON fc.business_id = bc.business_id
    JOIN Business b ON fc.business_id = b.business_id
)
SELECT
  bfc.business_id,
  bfc.name,
  bfc.first_category,
  bfc.stars,
  bfc.total_checkins
FROM
  BusinessWithFirstCategoryAndCheckins bfc
  JOIN CategoryAverages ca ON bfc.first_category = ca.cat_name
WHERE
  bfc.total_checkins > ca.avg_checkins
  AND bfc.stars > ca.avg_stars
ORDER BY
  bfc.first_category, bfc.name;
```

(Returns the average monthly increase in reviews to show the increase of new customers)

```
WITH MonthlyReviews AS (  
    SELECT  
        business_id,  
        DATE_TRUNC('month', date) AS review_month,  
        COUNT(*) AS monthly_reviews  
    FROM  
        Review  
    GROUP BY  
        business_id, review_month  
)  
MonthlyGrowth AS (  
    SELECT  
        mr.business_id,  
        mr.review_month,  
        mr.monthly_reviews,  
        LAG(mr.monthly_reviews, 1) OVER(PARTITION BY mr.business_id ORDER BY mr.review_month) AS  
prev_month_reviews,  
        (mr.monthly_reviews - LAG(mr.monthly_reviews, 1) OVER(PARTITION BY mr.business_id ORDER BY  
mr.review_month))::FLOAT / NULLIF(LAG(mr.monthly_reviews, 1) OVER(PARTITION BY mr.business_id ORDER BY  
mr.review_month), 0) AS growth_rate  
    FROM  
        MonthlyReviews mr  
)  
SELECT  
    mg.business_id,  
    b.name,  
    AVG(mg.growth_rate) AS avg_monthly_growth_rate  
FROM  
    MonthlyGrowth mg  
JOIN  
    Business b ON mg.business_id = b.business_id  
WHERE  
    mg.prev_month_reviews IS NOT NULL  
GROUP BY  
    mg.business_id, b.name  
HAVING  
    AVG(mg.growth_rate) > 0.329  
ORDER BY  
    avg_monthly_growth_rate DESC;
```