**Retrieve location**

Retrieve location with a certain radius:

0.5 km

Source: http://www.cs.nyu.edu/visual/home/proj/tiger/gisfaq.html

For short distances such as calculating the radius within 1 km, a flat-earth approximation is sufficient. Flat-earth formulas for calculating distance between two points show noticeable errors when distance is more than 20 km (12 miles).

More computationally accurate results are produced by the Haversine Formula, which gives mathematically exact results. However, as it is computationally heavy for SQL queries, this was not used.

Polar Coordinate Flat-Earth Formula:

where

Combining this equation gives us:

6367\*SQRT(SQUARE(PI()/2-currentLat) + SQUARE(PI()/2-latitude) –

2\*(PI()/2-currentLat)\*(PI()/2-latitude)\*COS(lontigude-currentLon))

SELECT \* FROM kd268.merchantLocations WHERE

6367\*SQRT((PI()/2 - currentLat)^2 + (PI()/2-latitude)^2 - 2\*(PI()/2 - currentLat)\*(PI()/2-latitude)\*COS(longitude - currentLon))

https://developers.google.com/maps/articles/phpsqlsearch\_v3#findnearsql

SELECT id, ( 3959 \* acos( cos( radians(37) ) \* cos( radians( lat ) ) \* cos( radians( lng ) - radians(-122) ) + sin( radians(37) ) \* sin( radians( lat ) ) ) ) AS distance FROM markers HAVING distance < 25 ORDER BY distance LIMIT 0 , 20;

Latitude and Longitude was in degrees, but the formula needed radians!!! DOH