Part I: Queries

Use the following database schema to answer questions 1-5. Answers can be a single query or a series of queries as necessary.

Helpful hints:

- A consumption "read" is a row in the consumption table, and tells us the cumulative gallons a customer used that month (total_gallons_used).
- One customer's gallons-per-day (GPD) = total_gallons_used / num_days_in_month.
- A MySQL dump containing the schema and sample data can be found here: https://gist.github.com/chaynes-ws/956e163155263fef1c3992f6b40c31b5

property	customer	consumption	consumption_goal	month_days
(int) property_id (str) address (str) city (str) state (str) zipcode	(int) customer_id (int) property_id (str) name	(int) customer_id (int) read_year (int) read_month (int) num_days_in_read (int) total_gallons_used	(int) customer_id (int) read_year (int) read_month (int) goal_gallons	(int) year (int) month (int) days

1) We have received a set of data from a client for December, 2018. We would like to validate that the number or reads is similar to the prior months. **Write a query to determine the number of reads in each month.**

2) Using your query from #1, we've determined that there are a fewer reads in the December data set than normal. **Write a query that finds all customer_ids that do not have a read in December, 2018.**

3) Our client is interested in how water usage has changed in reaction to a drought in various parts of their district. To ensure fair comparisons, they want to use a gallons-per-day (GPD) statistic instead of pure gallons consumed each month. **Write a query that calculates the average GPD used in each zipcode for each month.**

4) The utility is requesting a report of the change in water usage per household over time. They would like to see *year-over-year* percent change and *month-over-month* percent change for each customer. *Year-over-year* should compare one month's usage against the same month's usage a year ago (ex.: December 2018 vs December 2017). *Month-over-month* should compare a month's usage against the previous month (ex.: December 2018 vs November 2018). **Write a query to show the customer_id, year, month, year-over-year percent change, and month-over-month percent change.**

5) We would like to send the utility a list of homes that consistently failed to meet their usage goal. **Write a query to find the name, address, and average monthly excessive use over goal of customers that exceeded their goal in each of the last 6 months.**

Part II: Schema Design

Design a schema to store surveys and responses. Survey questions can be multiple-choice or free text. You can assume all responses will be anonymous.