Mid-Semester Presentation

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Notional Web Interface

Supported Queries

- Get a price from a meter for a specific year and month
- Get the average price for a meter over a year
- Get the energy demand for a meter for a specific year and month
- Get the average energy demand for a meter over a year
- Get the CO2e for a meter for a specific year and month
- Get the average CO2e for a meter over a year
- Get the attributes of a certain meter for every month of the year

Database Model - ER Diagram
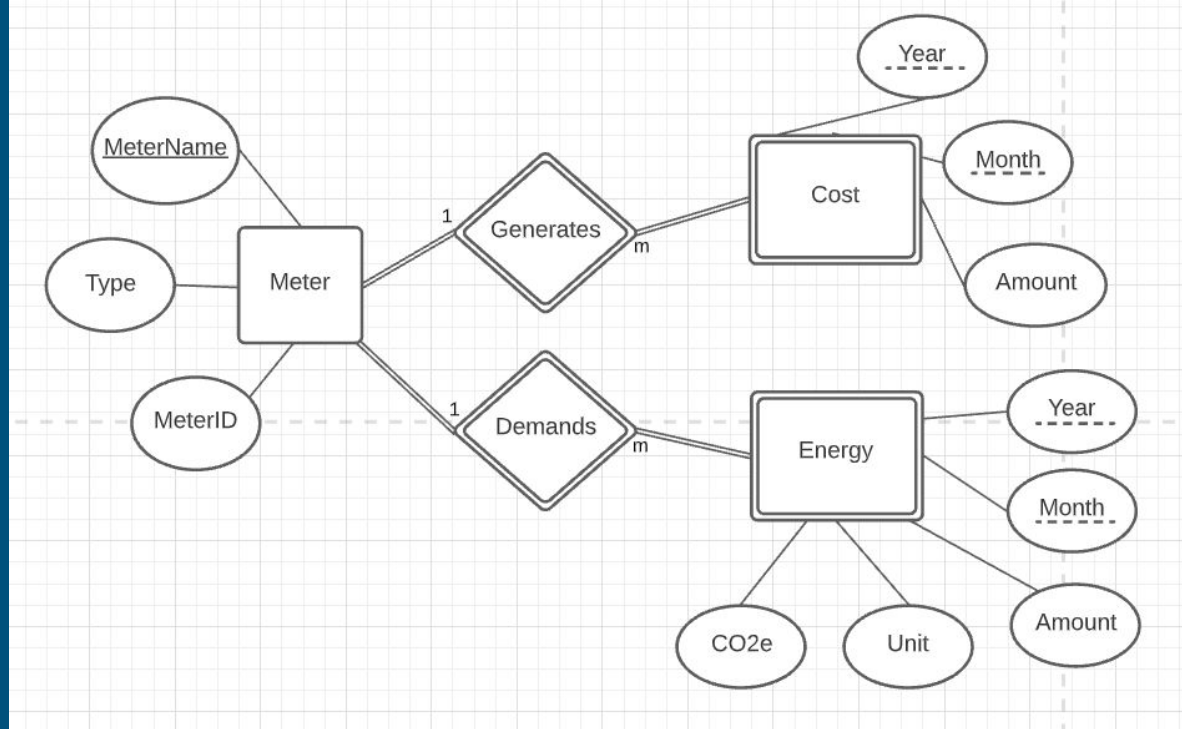
Database Model - Relational Schema
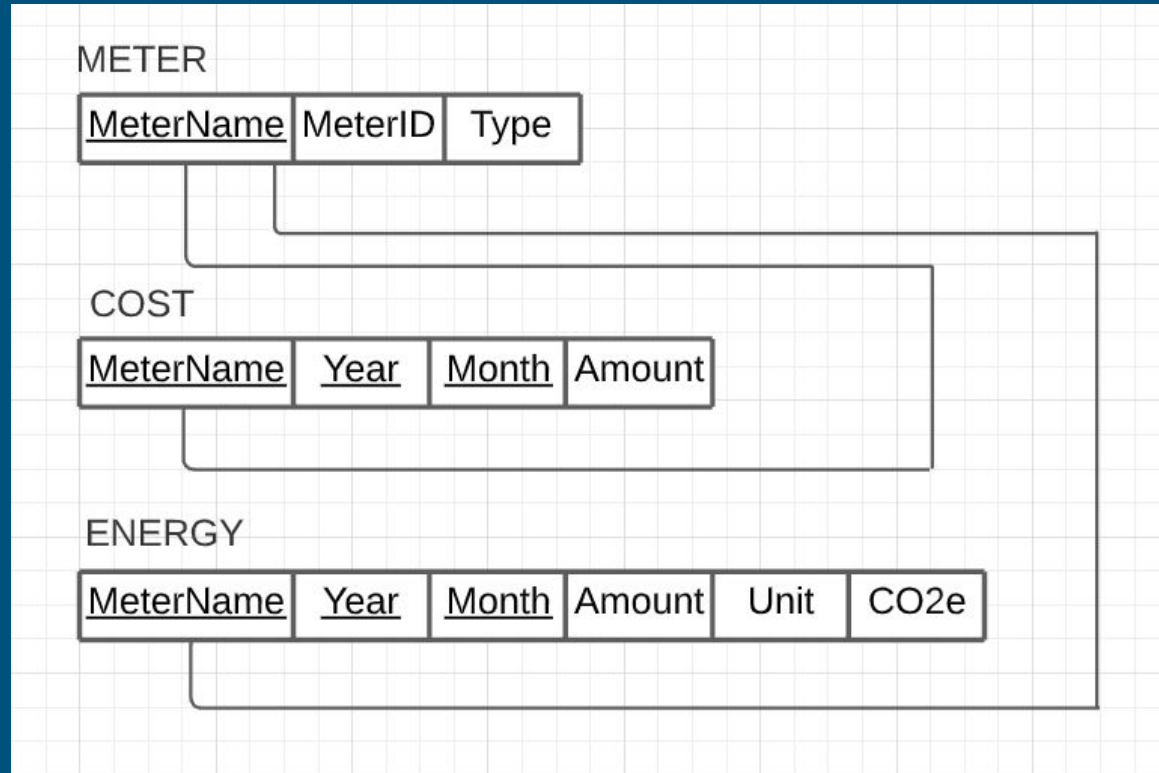
Estimated Size

- 22 rows * 3 columns = 66 records in Meter (22 meters and 3 values to keep track of per meter)
- 1426 rows * 6 columns = 8556 records in Cost (1426 meter readings, and 6 values to keep track of per meter reading)

Meter Consumption ID	Start Date	End Date	Delivery Date	Usage/Quantity	Usage Units	Cost ($)
1457394726	7/1/2009	7/31/2009	Not Available	58233	kWh (thousand Watt-hours)	3661.37
1457394727	8/1/2009	8/31/2009	Not Available	282323	kWh (thousand Watt-hours)	17949.02
1457394728	9/1/2009	9/30/2009	Not Available	405601	kWh (thousand Watt-hours)	23876.63
1457394729	10/1/2009	10/31/2009	Not Available	387746	kWh (thousand Watt-hours)	21179.26
1457394730	11/1/2009	11/30/2009	Not Available	769449	kWh (thousand Watt-hours)	38578.81
1457394731	12/1/2009	12/31/2009	Not Available	109448	kWh (thousand Watt-hours)	7305.06

Types and Average Number of Searches

- Types of searches: join, project, grouping and aggregate functions
- To get the price, energy demand, and CO2e for a meter, year, and month combination we will need to join METER and COST. Each join will require the join condition to be checked 1426 times. We will then project the needed attributes.
- To calculate yearly averages we will use the AVG aggregate function. We will first select the tuples by the input year. Then, we will group by MeterName - This will require 12 additions and a division for each meter. Finally, we will select the input meter.

$$USER\_METER \leftarrow \sigma_{MeterName=<UserMeterInput>}(METER)$$

$$USER\_COMBO \leftarrow \sigma_{Year=<UserYearInput>\ AND\ Month=<UserMonthInput>}(USER\_METER \bowtie_{MeterName=MeterName} COST)$$

$$PRICE \leftarrow \pi_{Amount}(USER\_COMBO)$$

Final Thoughts

Time-permitting Features

- Allowing user to enter many meter, month, and year combinations
    - Displaying individual statistics - cost, energy usage, and CO2e
    - Overlaying the yearly line graphs for cost, energy usage, and CO2e
    - Displaying yearly averages - cost, energy usage, and CO2e
- Associating meters with different buildings/parts of campus

Potential Changes

- Instead of calculating CO2e beforehand and storing in database, calculate it from energy demand (derived attribute)
- Split monthly energy demand data into a week or day representation (ie - would calculate weekly data by dividing monthly data by ≈4)