562 The Project

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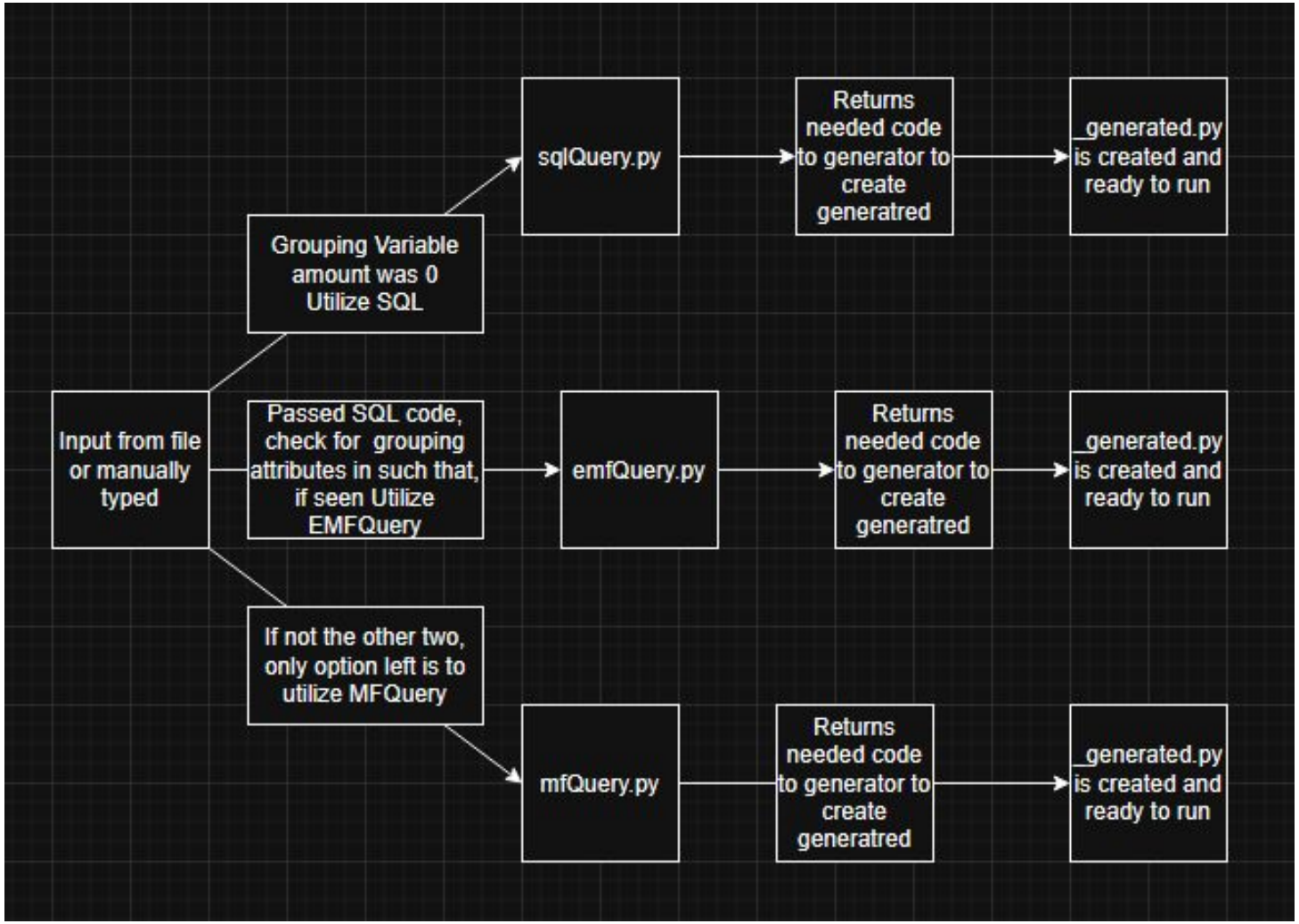
What is The Project?

- The Project is a query processing engine for Ad-Hoc OLAP queries
  - Extended SQL queries that include Multi-Feature and Extended Multi-Feature
- Trying to compute an Ad-Hoc OLAP query in standard SQL can lead to complex expressions with multiple views, joins, group-bys, and sub-queries. This takes up more resources leading to worse performance
- We solve this problem by introducing a framework to allow the expression of ad-hoc olap queries by extending the group-by statement and adding a new clause, “such that”
- Such that allows for a grouping variable which we will utilize in our query processing engine
- We will showcase our high level architecture, our query structure, the limits we faced, and our technology stack

High Level Architecture



Query Structure

We utilize the Phi structure and use its arguments as our query input

```
SELECT ATTRIBUTE(S):
cust, 1_sum_quant, 2_avg_quant
NUMBER OF GROUPING VARIABLES(N)
2
GROUPING ATTRIBUTES(V)
cust
F-VECT([F])
1_sum_quant, 2_avg_quant
SELECT CONDITION-VECT([C])
1.state = 'NY'
2.state = 'NJ'
```

Example of an input file

```
SELECT ATTRIBUTE(S):
prod, month, 1_sum_quant, 2_sum_quant
NUMBER OF GROUPING VARIABLES(N)
2
GROUPING ATTRIBUTES(V)
prod, month
F-VECT([F])
1_sum_quant, 2_sum_quant
SELECT CONDITION-VECT([C])
1.prod = prod and 1.month < month
2.prod = prod and 2.month > month
HAVING_CONDITION(G)
1_sum_quant > 0, 2_sum_quant > 266035
```

Example of an input file
with having condition

Technology Stack

- We utilized Python as our main language for the query processor
- psycopg2 was used to connect to the database
- PostgresQL was used to hold the database
- Tabulate is used to make the output structured

Limitations

- No error checking for missing tables, columns, rows
- Specific input file architecture is needed
- Some queries are very dependent on computer limitations such as the speed of the query

DEMO

Thank You!

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