**Motivation**

I want a meal plan for the day:
- Each meal must be gluten-free
- 3 to 6 meals per day
- Between 2,000 and 2,500 calories in total
- Minimal saturated fat!

**Language Specification: PaQL**

```sql
SELECT PACKAGE(R) AS P
FROM Recipes R
WHERE R.gluten = 'free'
SUCH THAT count(P.*) BETWEEN 3 and 6
AND sum(P.kcal) BETWEEN 2 AND 2.5
MINIMIZE sum(P.saturated_fat)
```

**Direct Query Evaluation**

Translation: PaQL to Integer Linear Programming

- \( \sum_{i=1}^{n} x_i \geq 3 \)
- \( \sum_{i=1}^{n} x_i \times t_{i,kcal} \geq 2 \)

**Scalable Query Evaluation**

The SketchRefine Algorithm:

- Multiplicity of representative tuples
- Representative and original tuples selected during previous steps, shown by batching lines, are aggregated and used to modify later refinement queries

**Experimental Evaluation**

- **Q1** to **Q7**
- Time vs. Dataset size
- Approximation Ratio: Direct vs. SketchRefine

- **Q1** to **Q7**
- Time vs. Partition size threshold
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