Excel Constraints

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1 Use cases

There are different ways that learned constraints could be used in practice:

- Find mistakes
- Suggest a formula for a specific field
- Suggest a next value
- Find structure and functions in a plain text sheet (such as a csv)

2 Desired output

The annotated example (fig. 1) demonstrates the most used constraints in Excel which we aim to identify automatically.

Aggregates Aggregate functions like sum, max, average, ... that reduce a range to a value

Conditional aggregates Aggregates that use a filter on their input

Series Ranges of integer numbers, ascending or descending (a special case of a permutation)

Lookups Exact or fuzzy lookups that use a key to find a corresponding value

Ranks Uses a range and a value to determine an order over elements

Structural constraints Foreign keys to test value consistency between ranges

Previous Uses row values and the previous value to compute the current value

Generally these constraints can be subdivided into:

- Row constraints
- Column constraints
- Inter-table constraints
- Nested constraints

3 Approach

Currently we are considering a ModelSeeker like approach were ranges and values are generated and constraints tested upon them. One option would be to use constraint-specific generators to avoid the explosion of the search space. Meta-information would be used to find the most specific constraints. A heuristic could use various information to determine which learned constraints are useful.

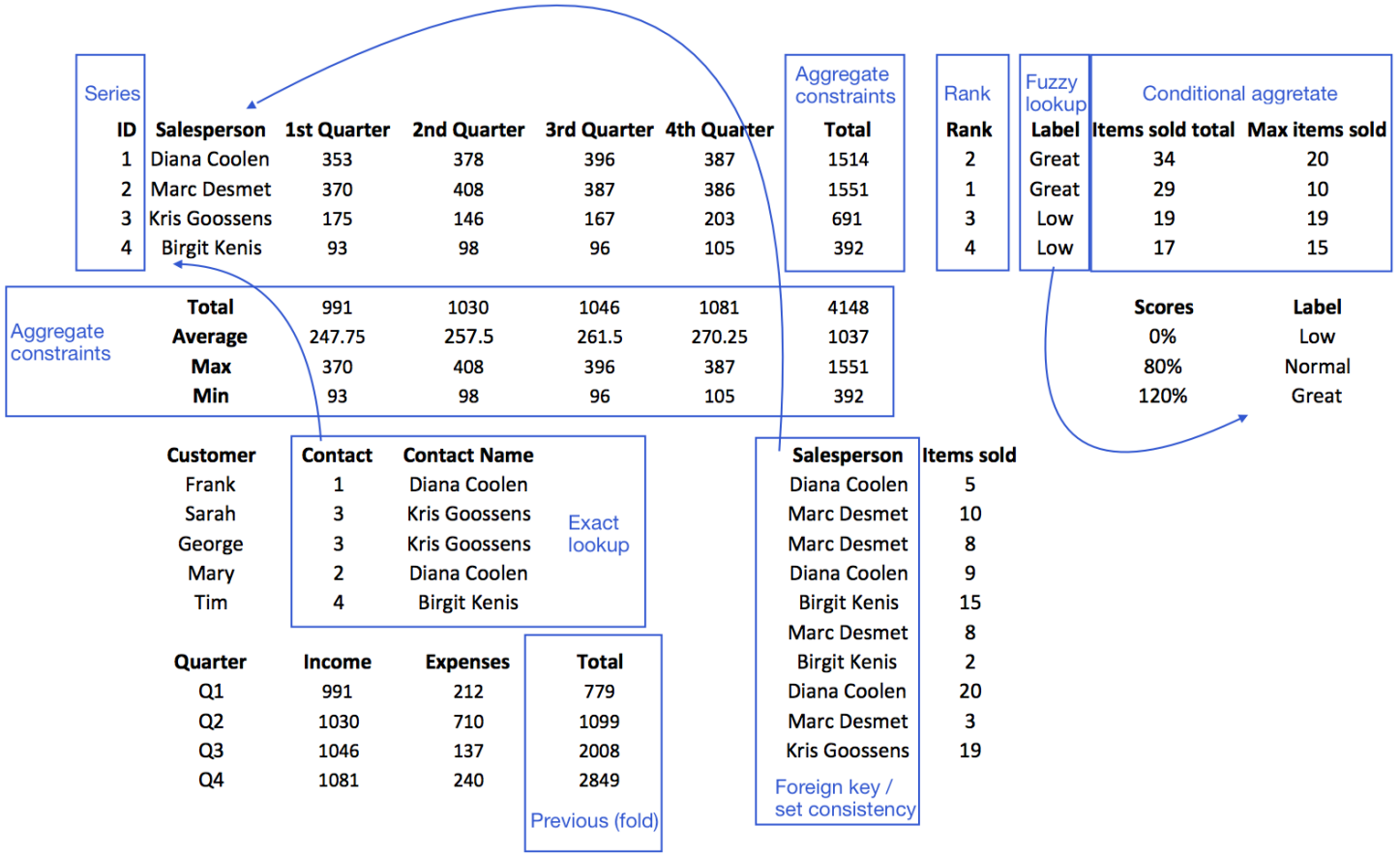

Figure 1: Demo example