# Specification Table Schema

**Relationship property**

Proposal

# 1 – Requirement

- **Specify the relationship between two fields**
  - Three main link categories (see right):
    - derived, coupled, crossed

- **Example :**
  - Field « quarter » is derived from « month »
  - Field « name » is coupled to field « nickname »
  - Field « year » is crossed with field « semester »

- **Validation :**
  - Simple function (see below)
  - Requires all data
  - Test possible with each new input (derived and coupled) and not possible with crossed

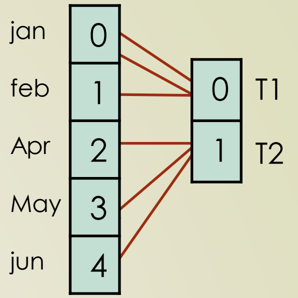
How to measure the link ?

The evaluation is made by calculating **dist = len(set(zip(a,b)))** where a and b are array of the two fields *(python langage)*

```
dist  >=   max(len(set(a)), len(set(b)))
dist  <=   len(set(a)) *  len(set(b))
```

**Quarter : [ T1, T2, T2, T1, T2, T1 ] (a)**
**Month : [ jan, apr, jun, feb, may, jan] (b)**

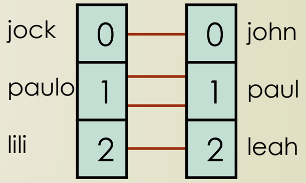
*derived*



```
if      dist == len(set(b))
and dist  >  len(set(a))
```

**Name : [ john, paul, leah, paul ] (a)**
**Nickname : [ jock, paulo, lili, paulo ] (b)**

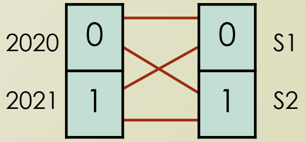
*coupled*



```
If      dist == len(set(b))
and  dist == len(set(a))
```

**Year : [ 2020, 2020, 2021, 2021 ] (a)**
**Semester : [ S1, S2, S1, S2 ] (b)**

*crossed*



```
If dist ==  len(set(a)) *  len(set(b))
```

# 2 – Implementation (three options)

- **1 – New Field descriptor**

```
« name »: « quarter »
« relationship » : {
        « parent » : « month »,
        « link » : « derived »
        }
```

- **Pros**
  - No mixing with other descriptors
  - Consistent with a field view
- **Cons**
  - New descriptor

- **2 – New Constraints descriptor**

```
« name »: « quarter »
« constraints » : {
        « relationship » : {
                « parent » : « month »,
                « link » : « derived »
        }
}
```

- **Pros**
  - The « constraints » property is consistent with the point
- **Cons**
  - The « crossed » link can't be validate at the data entry
  - Need to add a level in the properties tree

- **3 – New Table descriptor (other properties)**

```
« relationship » : [
        {
                « fields »: « quarter »
                « parent » : « month »,
                « link » : « derived »
        } …
]
```

- **Pros**
  - New independant descriptor
- **Cons**
  - Relationships are described field by field

**Option 1 seems to be the most suitable**

# 3 – Text Proposal

**Relationship**

The relationship property MAY be used to define the dependency between another field. The relationship descriptor, if present, MUST be a JSON object and MUST contain two properties :

- parent : the property name of the field linked to
- link : the nature of the relationship between them

The link property value MUST be one of the three following :

- derived :
  - The field values are dependant on the values of parent field (a value in the parent field is associated with a single field value).
  - E.g. The « Quarter » field [ T1, T2, T2, T1, T2, T1 ] is derived from the « month » field [ jan, apr, jun, feb, may, jan]
  - i.e. if a new entry 'jun' is added, the corresponding « quarter » value must be 'T2'.

- coupled :
  - The field values are associated to the values of parent field (both fields are derived from each other).
  - E.g. The « Nickname" field [ jock, paulo, lili, paulo ] is coupled to the "name" field [ john, paul, leah, paul ]
  - i.e. if a new entry 'lili' is added, the corresponding « Name » value must be 'leah' just as if a new entry 'leah' is added, the corresponding « nickname » value must be 'lili'.

- crossed :
  - This relationship means that all the different values of the field are associated with all the different values of another field.
  - E.g. the "Year" Field [ 2020, 2020, 2021, 2021] is crossed to the "Semester" Field [ S1, S2, S1, S2 ]
  - i.e the year 2020 is associated to semesters s1 and s2, just as the semester s1 is associated with years 2020 and 2021

# Appendix – Indexed List

*https://github.com/loco-philippe/Environnemental-Sensing/blob/main/documentation/Ilist_technical.pdf*