DATA PROPERTY EXAMPLES
February 19, 2013

Formal Definitions:

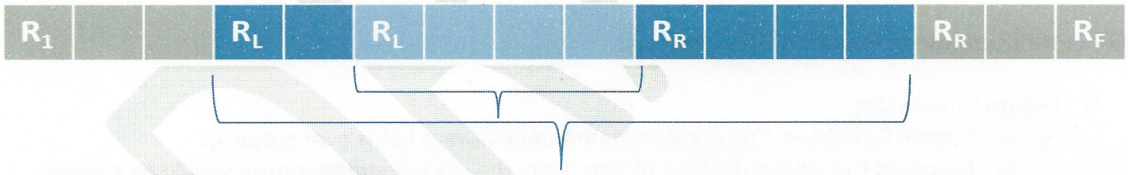
Scope {Dataset X, Initial Reading (R_1), Final Reading (R_F)}

Global Scope: [R_1, R_F]

Before R Scope: [R_1, R_R - 1] where R_R is the first reading where *condition* R holds

After L Scope: [R_L, R_F] where R_L is the first reading where *condition* L holds

Between L and R Scope: [R_L, R_R-1] where R_L is the reading where *condition* L holds and R_R is the reading where *condition R* such that $R_L < R_R$. In case of a repeating L and R then it is possible to have nested scopes where the last L is matched with the first R.



After L and Until R Scope: [R_L, R_R-1] when R holds after L and [R_L, R_F] when R never holds after L

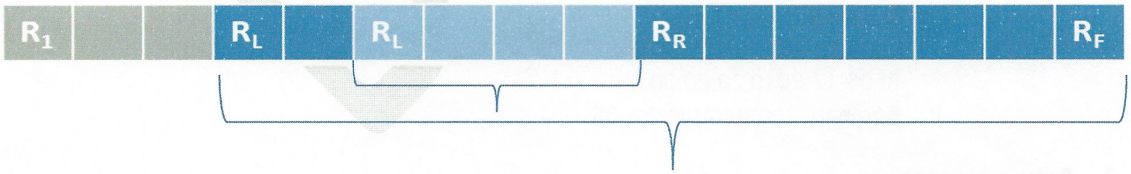


Fig. 1: Scope

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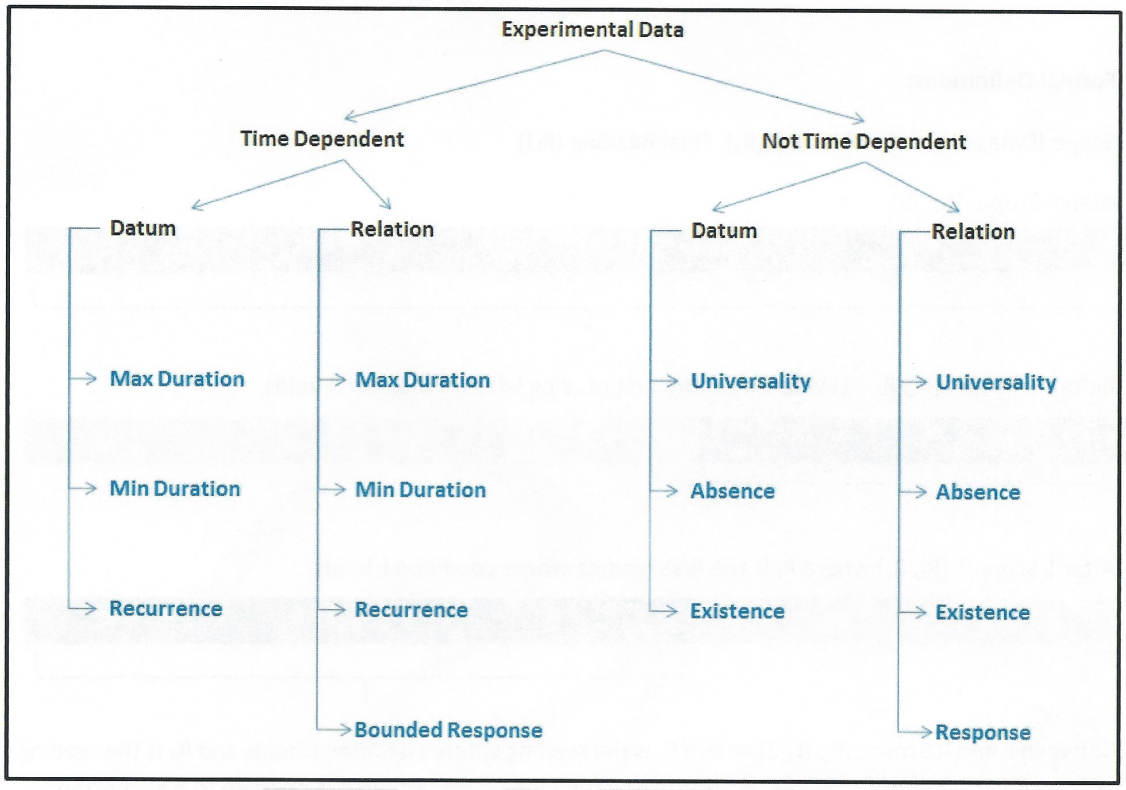

Fig 2: Taxonomy of patterns

NOT Time Dependent Patterns Descriptions:

1. **Datum Universality**
   a. **Formal Definition:** The Boolean statement P always holds over scope S_1.
   b. **Example:** During the daytime of May 12th, the dry bulb temperature should be smaller than or equal to 35.0 *°C*
   c. **Scope/Boolean Mappings:**
      i. **Scope**: Between L and R
      L: 05-12-2010 06:15:00.0
      R: 05-12-2010 20:00:00.0
      ii. **Boolean**: Temperature <= 35

2. **Datum Absence**
   a. **Formal Definition:** The Boolean statement P never holds over scope S_1.
   b. **Example:** During the daytime of May 12th, the dry bulb temperature should never smaller than or equal to 15.0 *°C*
   c. **Scope/Boolean Mappings:**
      i. **Scope**: Between L and R
      L: (05-12-2010 06:15:00.0)
      R: (05-12-2010 20:00:00.0))

ii. **Boolean**: (Temperature <= 15)

3. **Datum Existence**
   a. **Formal Definition:** The Boolean statement P never holds over scope S_1.
   b. **Example:** During the daytime of May 12th, the dry bulb temperature must be between 20 °C and 30 °C at some point
   c. **Scope/Boolean Mappings:**
      i. **Scope**: Between L and R
         L: (05-12-2010 06:15:00.0)
         R: (05-12-2010 20:00:00.0))
      ii. **Boolean**: (20 < Temperature < 30)

4. **Relation Response**
   a. **Formal Definition:** Given the calibrated scopes S_1 and S_2, if P holds at sensor reading t_i in S_1, then Q has to hold at the corresponding sensor reading t_i in S_2 or at sensor reading t_{i+1}.
   b. **Example:** If the temperature reaches 100°C, then the humidity must drop to 80% or less
   c. **Scope/Boolean Mappings:**
      i. **Scope**: Global (calibrated temperature and humidity datasets)
      ii. **P:** temperature = 100
      iii. **Q:** humidity= 80