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**Basic Module (3 KP)**
**Datenbanktechnologie**

**Topic: Gathering SQRT calculation**

The task is to implement BAT function (gsqrt) that calculates gathering square root. Function has the following signature: $gsqrt(BAT\ b1,\ BAT\ b2) \rightarrow BAT\ b3$, where

- $b1$ is an input BAT that denotes how tuples are split into groups,
- $b2$ is an input BAT over which values the square root operation is applied,
- $b3$ is a result BAT of sqrt operation applied to $b2$ ordered according to groups $b1$ with preservation of physical order of elements within one group.

$r$

| | L | H |
|---|---|---|
| $r_1$ | CH | 1 |
| $r_2$ | US | 4 |
| $r_3$ | CH | 2.25 |

$gsqrt(r)$

| H |
|---|
| 1 |
| 1.5 |
| 2 |

Table 1: Applying gathering sqrt

**Example 1** *Picture 1 illustrates how gathering sqrt is applied to relation $r$. First, $r$ is sorted according to attribute L with preservation of physical order within groups. Thus, tuple $r_1$ is always before tuple $r_3$, which belongs to the same group 'CH'. Second, sqrt is applied to attribute H. The result is shown in relation $gsqrt(r)$.*

The module includes the following steps:

1. Implement the BAT Algebra function gsqrt.

2. Implement the statement node for gsqrt operation.
3. Implement the translation of a statement node gsqrt to a MAL plan.
4. Write a report (approximately 5 pages) and hand it in before 01.07.2019.

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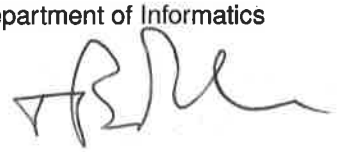

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