

Indexing Quiz Solution

Prof. Dr. Volker Markl

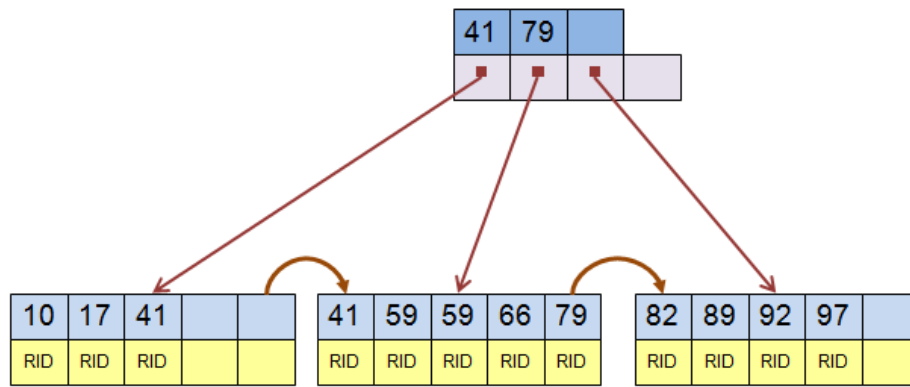
Alexander Alexandrov, Stephan Ewen,
Kostas Tzoumas, Fabian Hueske, Max Heimel



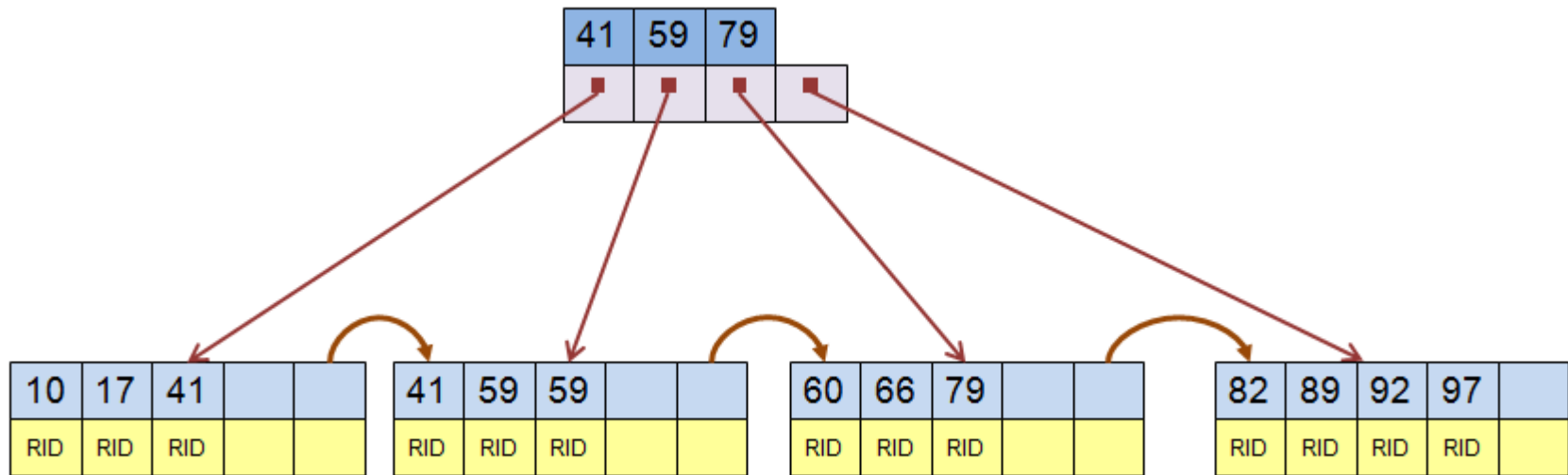
Fachgebiet Datenbanksysteme und Informationsmanagement
Technische Universität Berlin

<http://www.dima.tu-berlin.de/>

- Consider a B+-Tree, where the inner nodes contain n keys ($1 \leq n \leq 3$) and $n+1$ pointers. Each leaf contains m entries ($3 \leq m \leq 5$). The key conditions are: For pointer P_i , the associated key K_i is the value of the highest key in the sub-tree that P_i points to, if $i = n+1$ (last pointer in the node) then this key is not contained in the node. Insert operations may only trigger node or leaf splits and but not shifting of keys into bordering leafs. The initial setup of the tree is given below:



- Into that setup the following keys are in order inserted: 60, 70, 72, 68, and 61.
- Decide whether the following figures show valid states of the tree show above

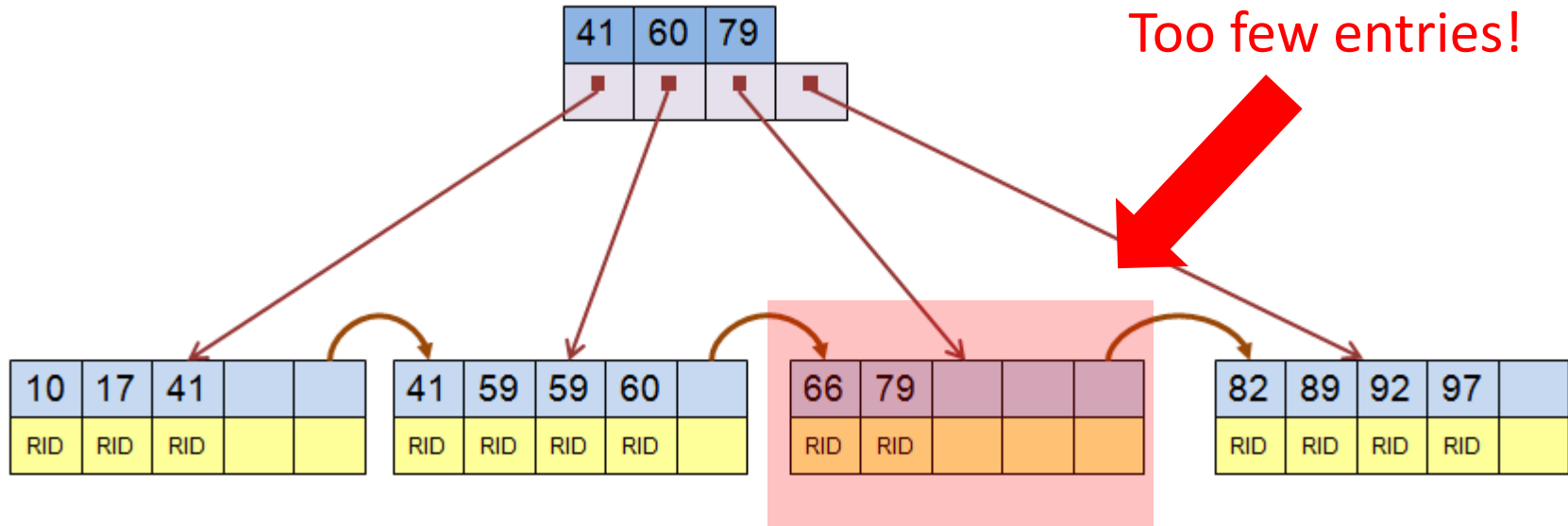


Decide:

This is a valid intermediate state:

TRUE

FALSE

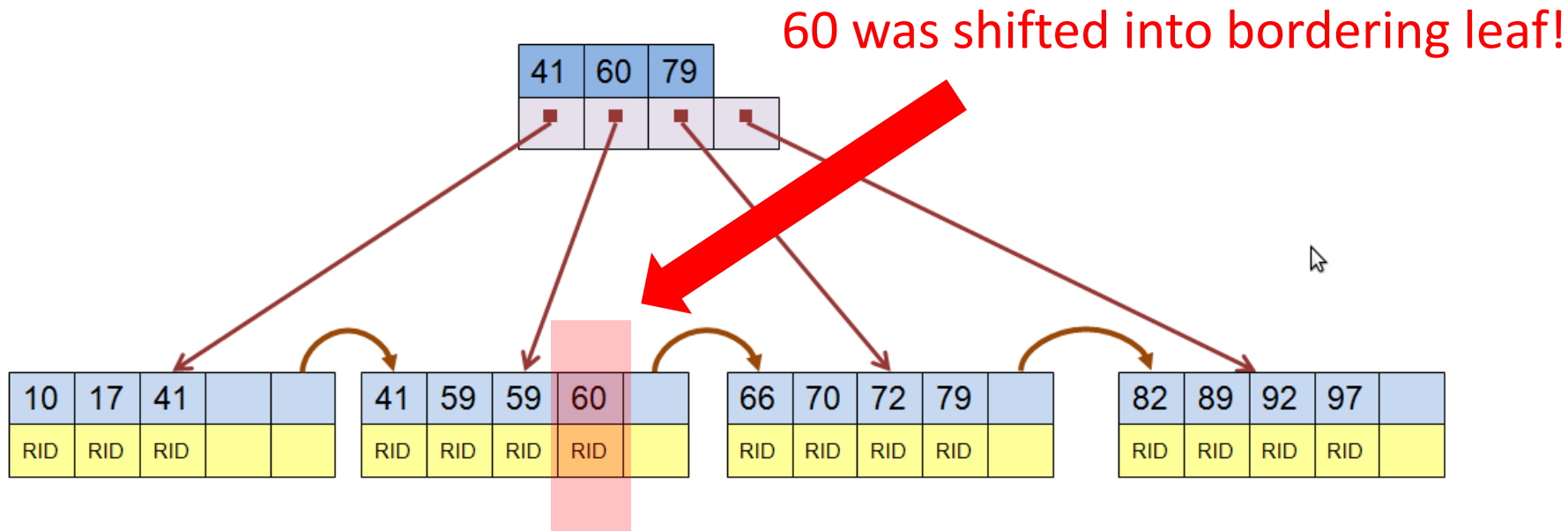


Decide:

This is a valid intermediate state:

TRUE

FALSE

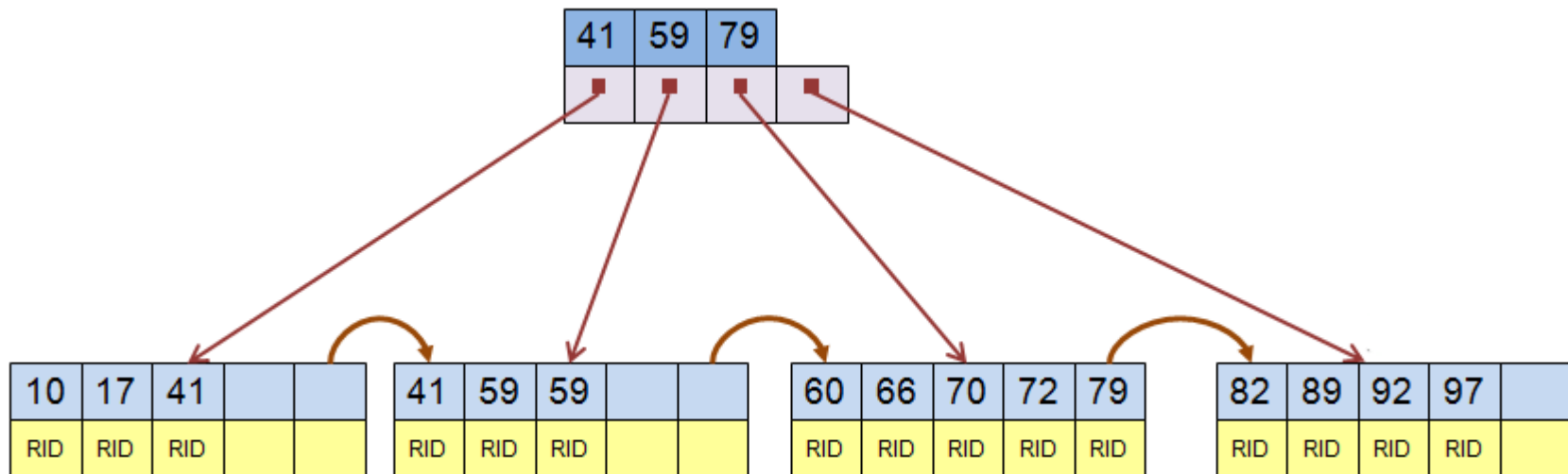


Decide:

This is a valid intermediate state:

TRUE

FALSE

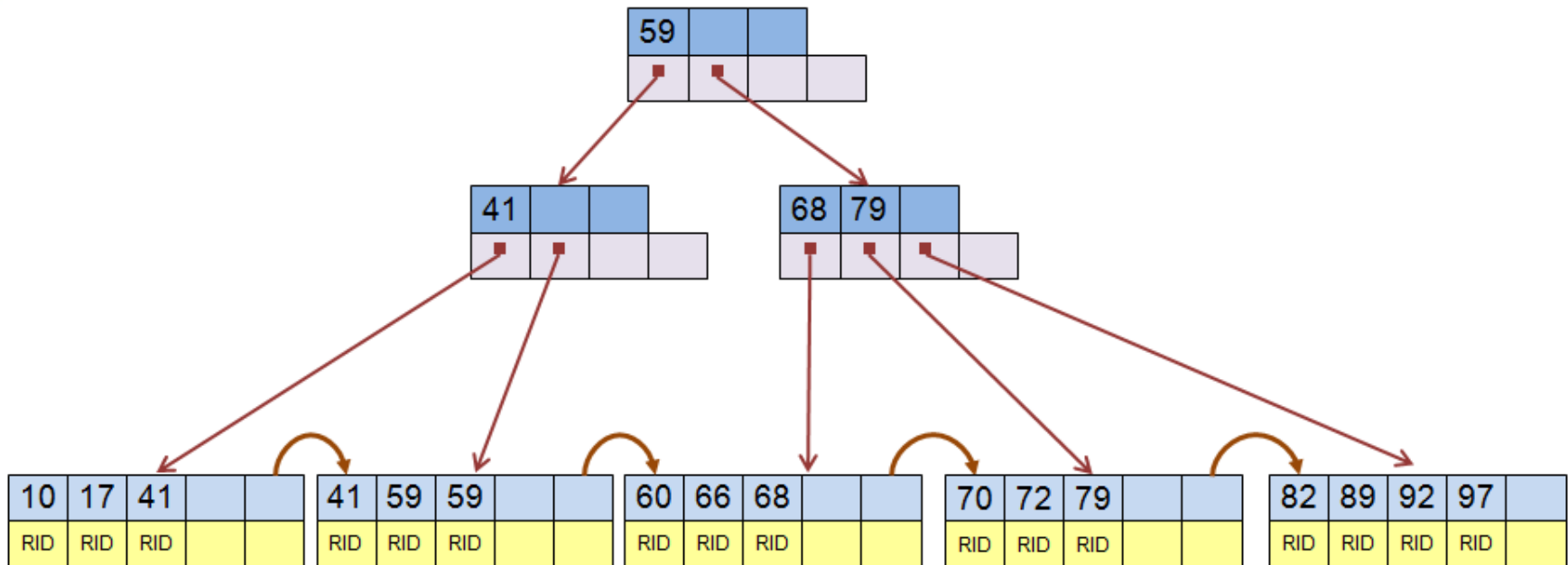


Decide:

This is a valid intermediate state:

TRUE

FALSE

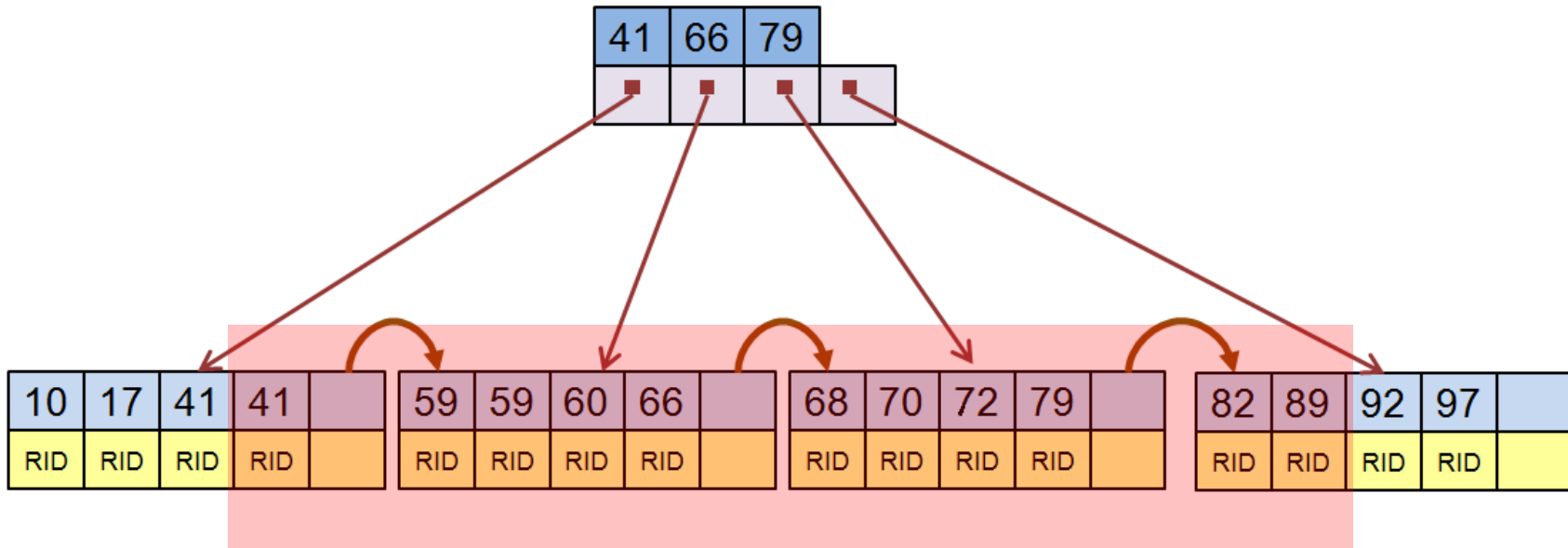


Decide:

This is a valid intermediate state:

TRUE

FALSE



Decide:

This is a valid intermediate state:

TRUE

FALSE

Multiple entries have been shifted!
Recursive split did not take place.

- Which of the following statements about extensible hash tables (EHTs) and B-Trees is **false**?

The quality of a hash table depends on the choice of the hash function.

Lookup operations require fewer I/Os with EHTs than with B-Trees.

Both can be used for efficient evaluation of point and range queries.

Inserting a new tuple in a B-Tree or EHT may change the global index structure.