Erratum for: A study of homogeneity in relational databases [Annals of Mathematics and Artificial Intelligence 33(2) (2001) 379–414]

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In definition 3.5 in [3], where we define the class QCQ^k , for every $k \geq 1$, we need to add a second requirement for a query to be in the class QCQ^k , namely that the answer to every query f in the class QCQ^k is always the union of complete FO^k types. Previously, we considered that property to be implied by our definition, but it turns out that it is not so. There are total computable queries which for some $k \geq 1$ preserve realization of FO^k types for k -tuples, but whose evaluation on some databases defines a relation which has not complete FO^k types for k -tuples. One example of such queries [1] is the query which defines a total order in the class of Odd Multipedes of Gurevich and Shellah [2].

We give below the correct definition, which should replace definition 3.5 in [3].

Definition 3.5.

- Let $1 \leq r \leq k$. A total computable r -ary query f is in the class QCQ^k , if f preserves realization of FO^k types for k -tuples and if for all databases I in $\mathcal{B}_\sigma$, and for all tuples $\bar{a}, \bar{b}$ in $dom(I)^r$, if $\bar{a} \in f(I)$ and $\bar{a} \equiv_k \bar{b}$, then also $\bar{b} \in f(I)$.
- $QCQ^\omega = \bigcup_{k \in \omega} QCQ^k$.

Correspondingly, definition 5.1 should also be changed in the same way:

Definition 5.1. For any schema σ , let us denote as $arity(\sigma)$ the maximum arity of a relation symbol in the schema. We define the class QCQ as the class of queries $f \in total(\mathcal{CQ})$, of some schema σ and of any arity, for which there exists an integer $n \geq \max\{arity(f), arity(\sigma)\}$, such that for every pair of databases I, J in $\mathcal{B}_\sigma$, if $I \equiv_{\tau_h} J$, then $\langle I, f(I) \rangle \equiv_{\tau_h} \langle J, f(J) \rangle$, where $h = \max\{n, \min\{k: I \text{ and } J \text{ are strongly } k\text{-homogeneous}\}\}$. We also require that the answer to the query f must be the union of complete FO^h types, i.e., for all databases I in $\mathcal{B}_\sigma$, and for all tuples $\bar{a}, \bar{b}$ in $dom(I)^r$, if

$\bar{a} \in f(I)$ and $tp_I^{FO^h}(\bar{a}) = tp_I^{FO^h}(\bar{b})$, then also $\bar{b} \in f(I)$. As in definition 3.4, regarding the last equivalence we consider the schema $\sigma \cup \{f\}$, where f is a relation symbol with the arity of the query.

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References

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