

## Corrections to definition of structure and $L$ -structure

**Definition 4.1.** A *structure*  $\mathcal{M}$  consists of a nonempty underlying set  $M$ , called the *universe* of  $\mathcal{M}$ , together with

- a sequence  $(c_i : i \in I_{\text{con}})$  of distinguished elements of  $M$ , called *constants*;
- a sequence  $(f_i : M^{n_i} \rightarrow M : i \in I_{\text{fun}})$  of distinguished maps from various cartesian powers of  $M$  to  $M$  itself, called *basic functions*; and,
- a sequence  $(R_i \subseteq M^{k_i} : i \in I_{\text{rel}})$  of distinguished subsets of various cartesian powers of  $M$ , called *basic relations*.

Each of the natural numbers  $n_i$  and  $k_i$  that appear above are assumed to be nonzero and are called the *arity* of the corresponding function or relation. The constants, basic functions and basic relations together make up the *signature* of  $\mathcal{M}$ .

**Definition 4.4.** A *language*  $\mathcal{L}$  is determined by specifying the following three sets of symbols:

- (i) a set of *constant symbols*  $\mathcal{L}^{\text{con}}$ ;
- (ii) a set of *function symbols*  $\mathcal{L}^{\text{fun}}$ , together with a positive integer  $n_f$  for every  $f \in \mathcal{L}^{\text{fun}}$  called the *arity* of  $f$ ; and,
- (iii) a set of *relation symbols*  $\mathcal{L}^{\text{rel}}$ , together with a positive integer  $k_R$  for every  $R \in \mathcal{L}^{\text{rel}}$  called the *arity* of  $R$ .

An  $\mathcal{L}$ -*structure* is then a structure  $\mathcal{M}$  together with bijective correspondences between  $\mathcal{L}^{\text{con}}$  and  $I_{\text{con}}$ ,  $\mathcal{L}^{\text{fun}}$  and  $I_{\text{fun}}$ , and  $\mathcal{L}^{\text{rel}}$  and  $I_{\text{rel}}$  that associates

- to each constant symbol  $c \in \mathcal{L}^{\text{con}}$  a constant  $c^{\mathcal{M}} \in M$  of  $\mathcal{M}$ ,
- to each function symbol  $f \in \mathcal{L}^{\text{fun}}$  a basic function  $f^{\mathcal{M}} : M^{n_f} \rightarrow M$  of  $\mathcal{M}$ ,  
and,
- to each relation symbol  $R \in \mathcal{L}^{\text{rel}}$  a basic relation  $R^{\mathcal{M}} \subseteq M^{k_R}$  of  $\mathcal{M}$ .

We say that the constants, functions, and relations,  $c^{\mathcal{M}}, f^{\mathcal{M}}, R^{\mathcal{M}}$ , are the *interpretations* in  $\mathcal{M}$  of the corresponding symbols.

*Remark.* Different symbols in  $\mathcal{L}$  can have the same interpretation. The only requirement is that the interpretation preserve the type of symbol and its arity.