

## Reference models

Solution **2.1** (**Linguistic and analogical mental representations**). We can create an analogical representation using set theory in this way:

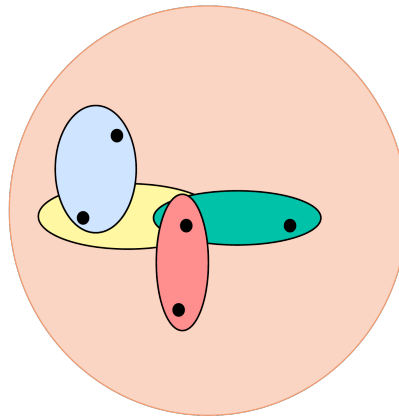


Fig. 0.1: Monkey and banana

Solution **2.2** (**Linguistic and analogical mental representations**). This time we use a labeled set theory diagram:

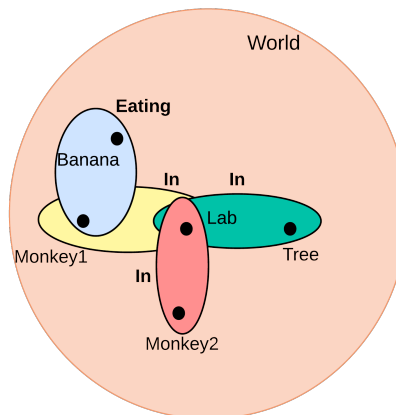


Fig. 0.2: Monkey and banana

Solution **2.3** (**Linguistic and analogical mental representations**). We can create an analogical representation using knowledge graphs in this way:

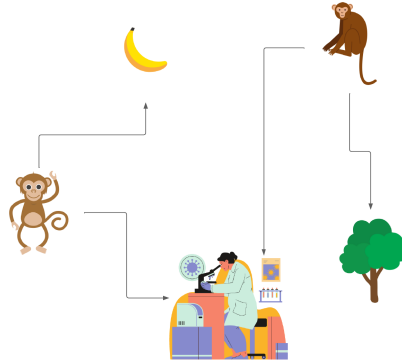


Fig. 0.3: Monkey and banana

Solution **2.4** (**Linguistic and analogical mental representations**). This time we use a labeled knowledge graph:

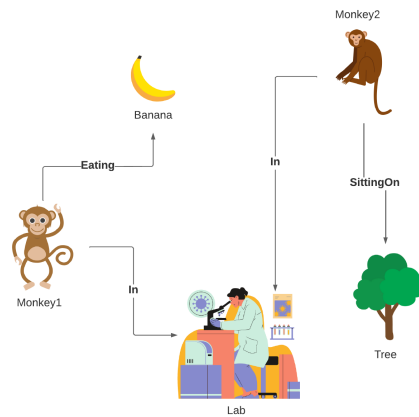
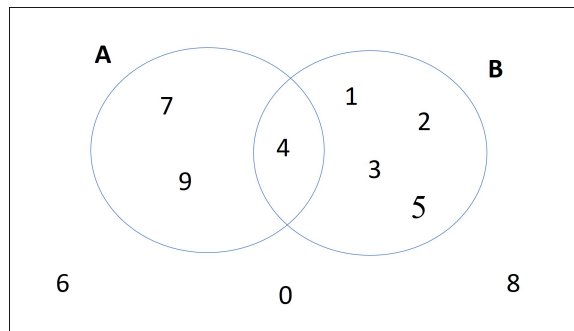


Fig. 0.4: Monkey and banana

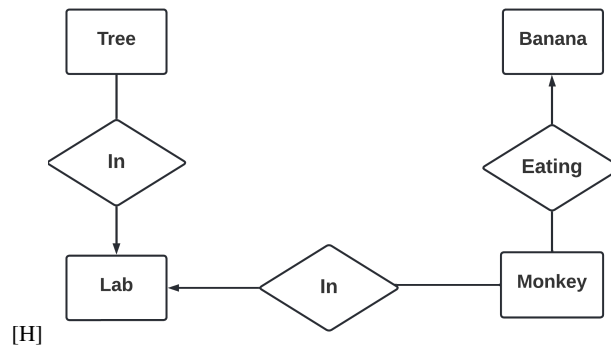
Solution **2.5** Answer:



Solution **2.6** ANSWER: b, d, e.

Solution **2.7** ANSWER: (a) brother of, colleague of, roommate of;  
ANSWER: (b) parent of, mother of, manager of.

Solution **2.8 (ER Creation)**. We can create an ER diagram from the theory in this way:



Solution **2.9 (Complete and Correct?)**. The model is **incorrect** respect to the theory.

Solution **2.10 (Complete and Correct?)**. The model is **correct** respect to the theory.

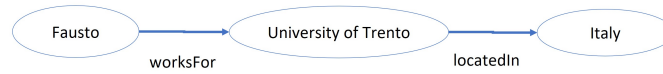
Solution **2.11 (Complete and Correct?)**. The model is **incomplete** respect to the theory.

Solution **2.12 (Complete and Correct?)**. The model is **complete** respect to the theory.

Solution **2.13 (Complete and Correct?)**. The model is **correct and complete** respect to the theory.

Solution **2.14** ANSWER: it is a directed labelled graph. Notice that it can be eventually cyclic, according to the phenomenon to be modelled.

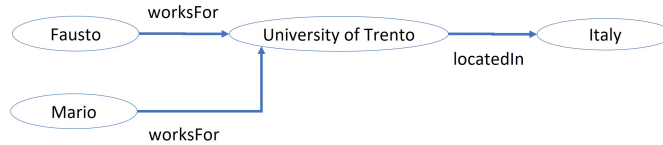
Solution **2.15**



<Fausto> <worksFor> <University of Trento>

<University of Trento> <locatedIn> <Italy>

Solution **2.16**

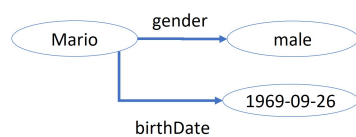


<Fausto> <worksFor> <University of Trento>

<Mario> <worksFor> <University of Trento>

<University of Trento> <locatedIn> <Italy>

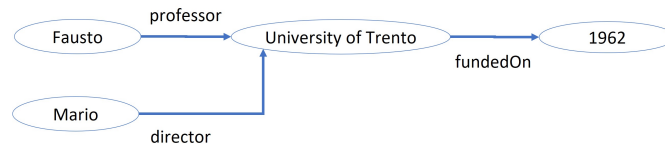
Solution **2.17**



<Mario> <gender> <male>

<Mario> <birthDate> <1969-09-26>

Solution **2.18** A POSSIBLE ANSWER: The University of Trento was funded on 1962. Fausto is a professor of the University of Trento. Mario is a director of the University of Trento.



Solution **2.19**

- ANSWER: YES, BECAUSE THERE IS AN EXACT CORRESPONDENCE.
- ANSWER: NO, BECAUSE WE DID NOT SPECIFY IN THE GRAPH THE “WORKS FOR” RELATION.
- ANSWER: YES, IT IS CONSISTENT DESPITE NOT COMPLETE.

Solution **2.20** By now you should be able to do it without help.

Solution **2.21** By now you should be able to do it without help.

Solution **2.22** By now you should be able to do it without help.

Solution **2.23** By now you should be able to do it without help.

Solution **2.24** By now you should be able to do it without help.