# The Correspondence between DLs/OWL and OO

The analogy between DLs and object-orientation can be observed when it is considered that the basic task in constructing an ontology is classification. Explicit subsumption relationships between concepts can be defined in the TBox. In object-orientation this can be achieved by definition of an inheritance hierarchy between classes. Classification is further solidified as the basis of DLs in that the core reasoning capabilities they provide are subsumption and instance checking. Subsumption computes a subsumption hierarchy, which essentially categorizes concepts into superconcept/subconcept relationships. Instance checking verifies whether a given individual is an instance of a specific concept [1].

In object-orientation the domain of interest is described in terms of classes that have properties, which are defined via attributes and/or associations. Classes in essence have a set-theoretic semantics, i.e. a class represents a set of objects in the domain of interest which shares attributes. Objects that are classified by a class are called instances of the class. The analogy with DLs is that classes, attributes/associations and instances (or sometimes called objects) correspond respectively with concepts, roles and individuals in DLs, which in OWL corresponds respectively to classes, properties and individuals.

This correspondence between object orientation, DLs and OWL 2 is summarized in Table below.

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| **Object orientation** | **DLs** | **OWL 2** |
| Class | Concept | Class |
| Attribute/association | Role | Property |
| Object | Individual | Individual |

# Works Cited

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| [1] | F. Baader, D. Calvanese, D. L. McGuinness, D. Nardi and P. F. Patel-Schneider, The Description Logic Handbook: Theory, Implementation and Applications, Cambridge University Press, 2007. |