Figure 4: Example OPPL script for detecting instances of a pattern. It defines two class variables; ?PresentSituation, ?Finding. The SELECT statement will select all axioms that instantiate this variable expression. The ADD statement will add all entities that instantiate the SELECT statement as subclasses of the PatternInstance class.

1. Design discrepancies in the asserted axioms in an ontology.

2. Deliberate deviations of a pattern

We pinpoint such defects in the ontology and we verify a portion of them by referring to the SNOMED-CT literature. The design discrepancies we highlight mainly refer to missing restrictions. The rest are categorised as deviations from an expected pattern. We show that parts of the ontology that do not follow a particular pattern are more prone to design discrepancies, such as missing restrictions, incorrect descriptions etc. That is expected, since the developers have a higher level of freedom to describe concepts that do not have a general pattern, and, therefore, there is more room for error.

Materials and methods

The RIO framework

In [16] we introduced RIO; a framework for spotting regularities in ontologies. The framework is based on cluster analysis, the purpose of which is to partition data into groups (clusters) that are meaningful, useful or both [20]. The RIO framework enables the partitioning of a set of entities in an ontology according to similar usage, i.e.: entities in the same cluster occur with similar axioms playing similar roles. Therefore, the detection of regularities is based on the following two general steps:

1. The computation of clusters of similar entities in the ontology.