Task 1: Creating a UML Profile

Papyrus is an open source UML modelling tool which supports creating UML profiles and dedicated UML profile editors. Thus, in Step 1 your task is to create a UML profile in Papyrus which forms the foundation of your UML profile editor. This default knowledge points you to the just direction in completing this task.

A bit background, you can safely skip if you consider yourself a modelling expert:

The principle of separation of concerns is widely used in engineering, to address the ever growing complexity of system designs. This principle has led to the development of domain specific modelling languages (DSML). Those DSMLs provide constructs that are directly aligned with the concepts of the domain in question.

The Object Management Group (OMG) is one of the principal international organisations promoting standards supporting the usage of model-based software and systems development. The Unified Modelling Language (UML) standard is the most representative of these and has had definitively significant successes in the software industry as well as in other domains, such as IT and financial systems. UML was designed as a general-purpose modelling language as well as a foundation for deriving different domain-specific languages, mainly through a mechanism called UML profiling.

UML profiling enables the developers to derive domain-specific modelling languages from UML's set of general language concepts. An important advantage of this approach to DSML design is that it allows reuse of existing UML tools and widely available UML expertise (therefore alleviate the integration problem for models defined in different DSML using different technologies). The basic premise of profiles is that all domain specific concepts are derived as extensions or refinements of existing UML concepts, called UML metaclasses. These extensions are called stereotypes. A stereotype definition must be consistent with the abstract syntax and semantics of standard UML meta-classes it extends. Consequently, a profile-based model can be created and manipulated by any tool that supports standard UML. Moreover, because the concepts underlying a profile specialisations of existing UML concepts, users with UML knowledge can adapt to the approach more easily.

A stereotype is defined either as an extension of a UML base metaclass or as a specialization of an existing stereotype. The extension relationship of UML is not an association but a kind of association directed from the stereotype to the extended metaclass. Consequently, the metadata conveyed by the associated the attributes of the stereotype are associated to the extended metaclass in a transparent manner for the metaclass itself. This allows profiles owning the stereotypes to be applied and removed dynamically without modifying the underlying models—a fundamental feature of the profile mechanism.

Read more about UML profile in [1].

You are asked to create a UML profile based on a class diagram we provide.

In order to create an UML profile, you need to

1. Identify the Nodes and Edges in the metamodel;
2. Import the corresponding meta-classes from the UML metamodel (e.g. Class for nodes and Association for edges);
3. Create corresponding Stereotypes;
4. Link the Stereotypes with the meta-classes they extend using the "Extension" edge in the palette;
5. Define the UML profile, give the profile a name and URI and save it so that Papyrus defines this version of the profile in its registry.

Tasks:

1. **Define an arbitrary Stereotype for the Class meta-element.**
2. **Define an arbitrary Stereotype for the Association meta-element.**
3. **If you find no problems with the previous tasks, define the UML profile in full.**

Note: You have 60 minutes to complete this task