Components Based Design:

Specification of the X2B Software Development

Version 1.0

Software Specification:

The student must define, design, develop and document a software application which main goal is to create images representing UML Class diagrams, formed from an input file in XMI that represents the Class diagram without visual representation.

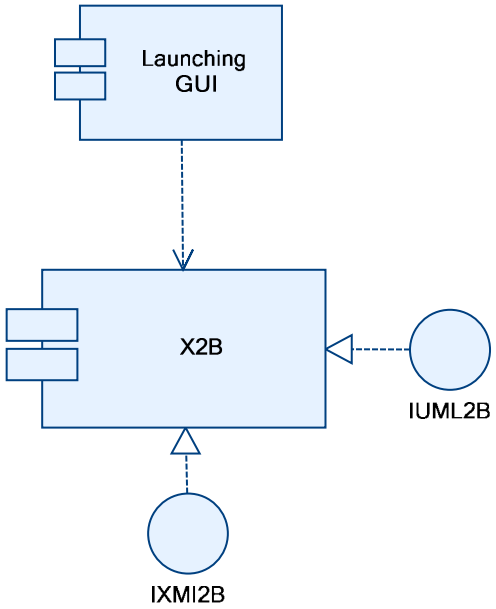
The output image type (bmp, giff, jpg, etc…) is not a requirement, so it is a free decision. However, it must selected from one of the normal types existing in the market.

As a side result, the software must provide also with an extended XMI file including the special positions for the UMLModel.

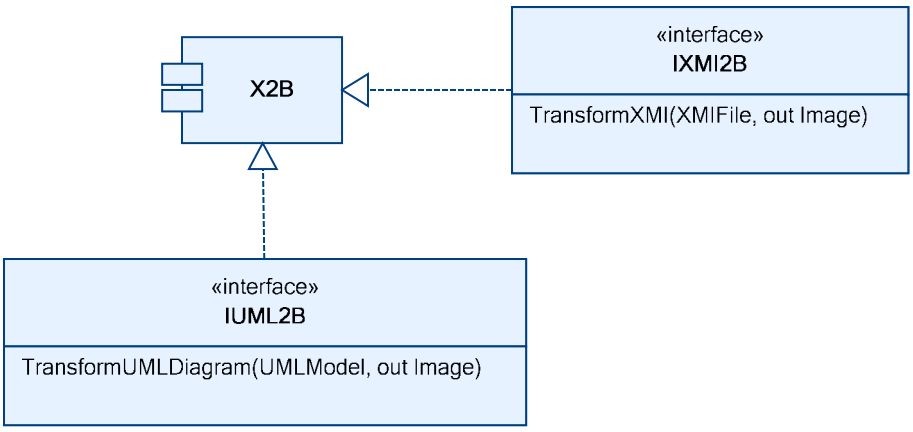
The XMI input file will be compliant with UML v.2.0.

The application must be a component itself, with very clear Interfaces.

The following components diagram represents the minimal architecture of the application to be developed:



And explicitly, the architecture for the X2B component should be:

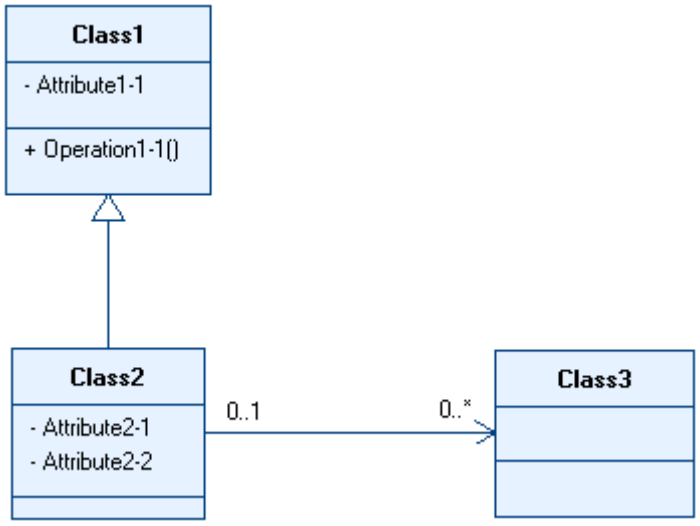


In order to clarify the specification, the following example is proposed.

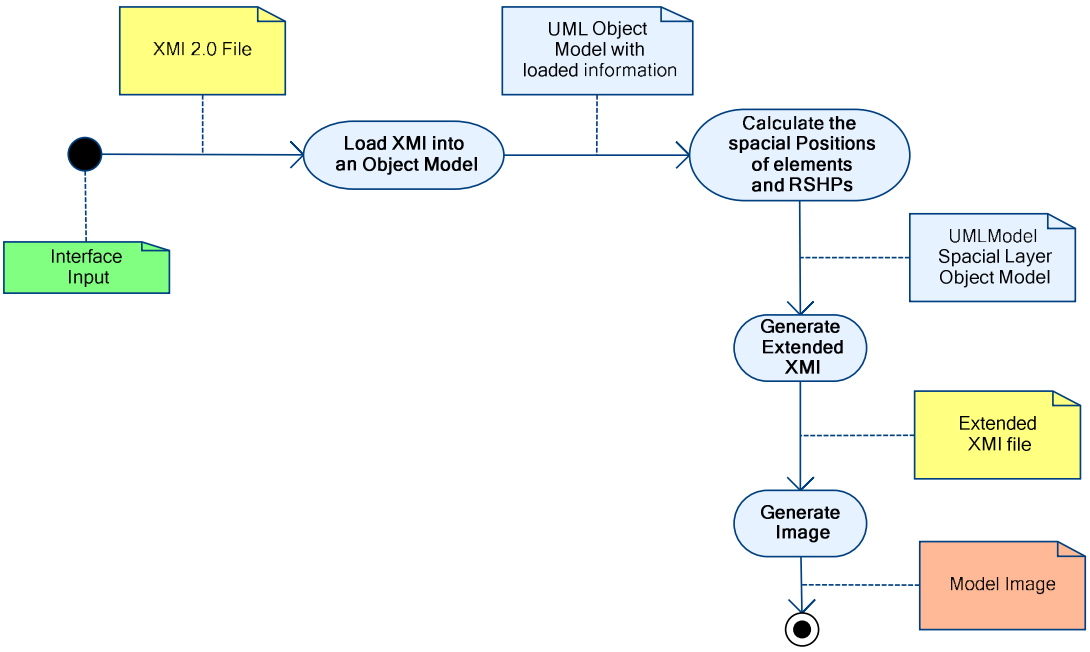
An XMI file includes the information of a model formed by 3 classes Class1, Class2 and Class3.

Class1 includes Attribute1-1 and Method1-1
Class2 includes Attribute2-1 and Attribute2-2
Class3 does not include Attributes neither methods.
Class1 is a super class of Class2
Class2 is associated with Class3, with a multiplicity of 1 to many and navigability from Class2 to Class33.

The result of the operation of the component should be a similar *image* than:



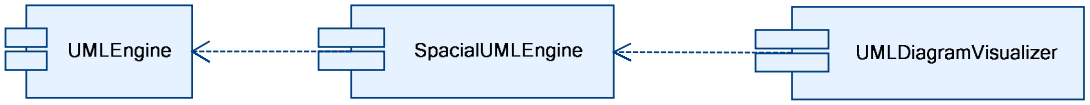
The expected functional workflow for the X2B is presented in the following Activity diagram:



The student will find her/his own architectural solution, linking, connecting and developing the desired or found components. Anyhow, the following possible components *could* (but must NOT) be relevant to the problem, depending on the solution found:

1. A UML Object model
2. A Spatial UML Object model
3. A UML drawing tool, library, component

The possible dependencies of the components are shown in the following components diagram:



The student IS NOT LINKED to this workflow, or any particular distribution of components. They are only provided for better understanding of the specifications. She/he is open to create her/his own workflow, components identification, acquisition and creation in order to fulfill the requirements and get the required final results.

Educational Requirements:

1- In order to pass the CBD course, the students must define, design, develop and document a software application based on the specifications described in this document.

2- The system must be developed using Microsoft Visual Studio 2005.

3- The following deliverables are expected:
   - A Software component (dll) named X2B.dll
   - A Launcher that uses and starts de Component (exe file)
   - The source code in a Microsoft Visual Studio 2005 project.
   - A Software Reuser project with the software designs (www.reusecompany.com)
   - A Ms Word document with the Architectural and Detailed design documents
   - A Video (wmv , avi etc.) with the documentation of the code.

4- Every student must join a group of students formed by at most 3 persons, in order to develop the application.

5- The student will get (at the beginning of the project) a set of input documents (XMI files), together with a set of the corresponding output documents (Images). The output documents depict the solution of the input problems.

6- At the end of the course, the system will be tested with a new set of input documents (XMI files), where output documents will be asked for (Images).

7- The student will pass the subject if his/her component solves the educational requirements number 5 and 6.

8- Once the student has passed requirement 7, the final marks will be gathered by applying the following criteria, during a competition between all the projects.
   - Less number of cross lines for the tests of requirement 6.
   - Better structure of relationships
   - Higher & of COTS / all components
   - Best design
   - Best performance

9- The deadline to present the system will be the examination Date.