Advanced Software Modeling and Engineering
MoSIG – M2

Textual models
– Xtext and meta-models –

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Use XText to implement the following solutions of Exercises 1 and 2 (Part 2)

Exercise 1 (Part 2)

a) XText grammar

```
Model :
      (importLink+=Import)*
      (elements+=Type)*;

Import : 'import' importURI=STRING ';' ;

Type : SimpleType | Entity;

SimpleType : 'type' name=ID ';';

Entity :
      'Class' name=ID ('extends' extends=[Entity])? '{'
            (properties+=Property)*
      '}';

Property :
      visibility=Visibility name=ID ':' type=[Type] (many?='[]')? ';';

Visibility : 'public' | 'private' | 'protected' ;
```

b) What happens if we put `(many='[]')?` in place of `(many?='[]')?`
c) Is the following rule correct?

```
      Property :
        (visibility='public' | visibility ='private' | visibility ='protected')
            name=ID ':' type=[Type] (many?='[]')? ';';
```

Exercise 2

a) A model in a dedicated language

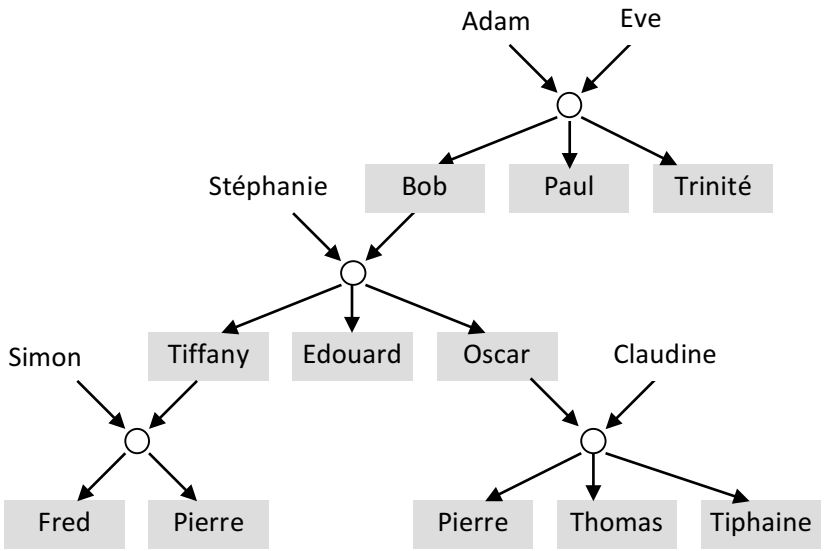
```
Questionnaire "Just for fun questionnaire"

Question "What is your name?" lastName

Question "How do you feel today?" feeling
() "In excellent shape" Excellent
() "Ill-at-ease" Ill
() "Uncomfortable" Intermediary

Question "What is your favourite meal?" meal
[] "Pizza" Pizza
[] "Pasta" Pasta
[] "Sushi" Sushi
```

b) Is the following Xtext grammar ambiguous? Correct it!

```
Model :
  'Questionnaire' name=STRING (lesQuestions+=Question)* ;

Question : 'Question' label=STRING kindOf=Kind ;

Kind : input | choice | option ;

input : name=ID ;

choice : name=ID (lesChoix+=check)*;

check : "[]" label=STRING name=ID;

option : name=ID (lesOptions+=radio)*;

radio: "()" label=STRING name=ID;
```

Exercise 3: Case study (To be evaluated)

We would like to define a domain specific language dedicated to the representation of family trees. The following family tree represents descendants of the Addams family.



The textual representation of this tree is shown below. Family members are grouped within the clause **`Family {...}`**. Words **`Father`** and **`Mother`** refer to members declared in clauses **`Sons`** and **`Daughters`**. Declaration of new members is therefore done in these clauses. That is why the textual model below we define a particular family named **`PersonsWithoutKnownParents`**. It contains the tree roots.

```
Family Addams{
    Father Adam
    Mother Eve
    Sons Paul Bob
    Daughters Trinite
}

Family Addams{
    Father Bob
    Mother Stephanie
    Sons Edouard Oscar
    Daughters Tiffany
}

Family Addams{
    Father Oscar
    Mother Claudine
    Sons Pierre Thomas
    Daughters Tiphaine
}
```

```
Family Bazex{
    Father Simon
    Mother Tiffany
    Sons Fred Pierre
}

Family PersonsWithoutKnownParents{
    Sons Adam Simon
    Daughters Eve Claudine Stephanie
}
```

1. Propose an XText grammar for this DSL
2. Present the meta-model issued from your grammar
3. Put on teide your source code, and a report (up to 4 pages) describing your solutions and your choices