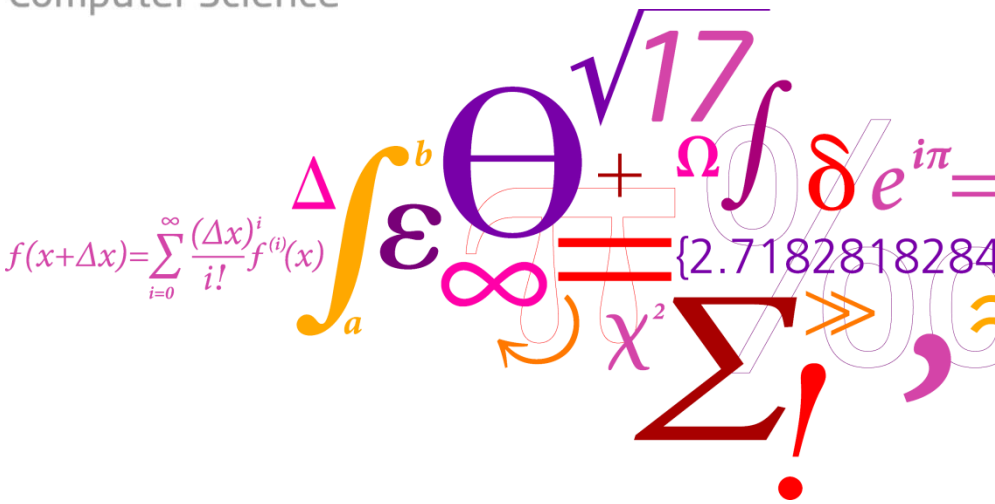
Model-based Software Engineering
(02341, spring 2016)

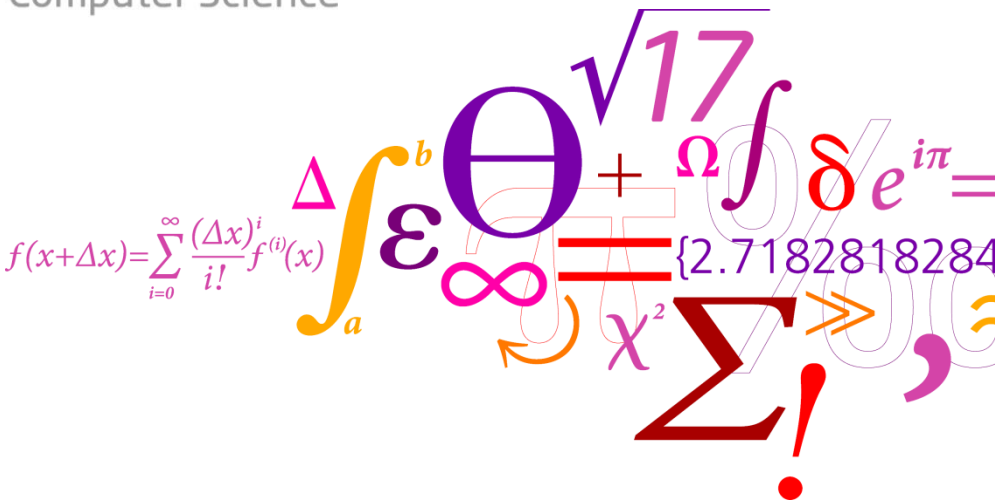
Ekkart Kindler

DTU Compute
Department of Applied Mathematics and Computer Science



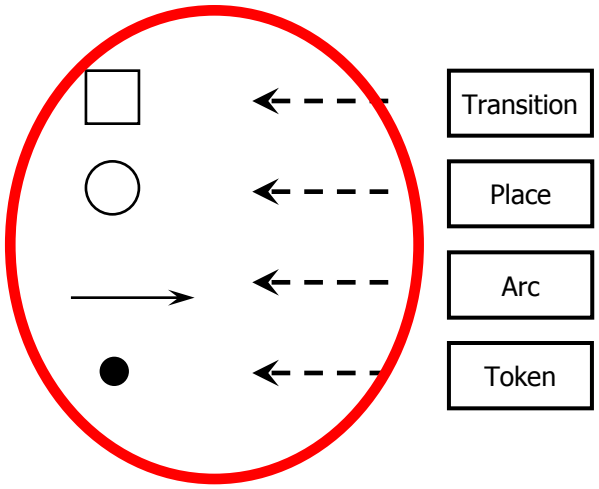
Tutorial 3: GMF

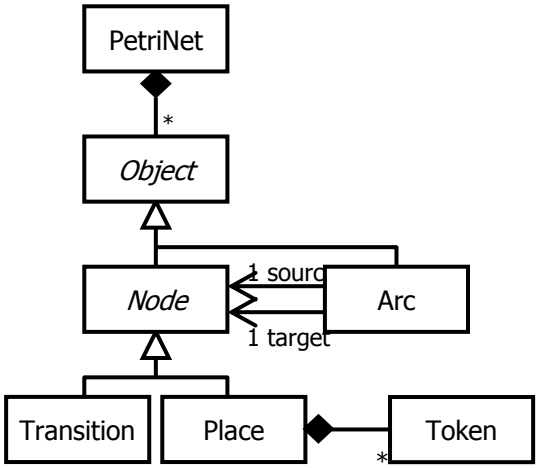
DTU Compute
Department of Applied Mathematics and Computer Science



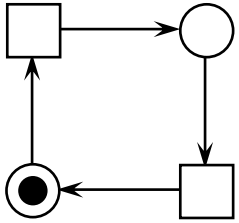
GMF: How to do this

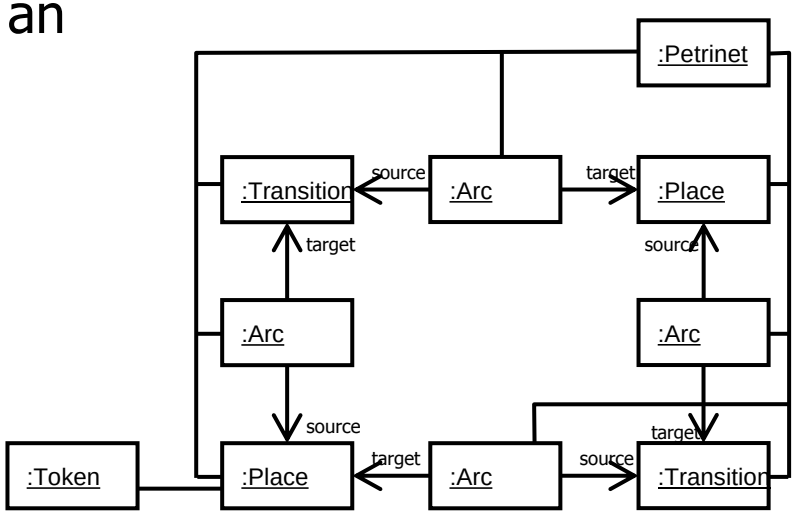
DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler





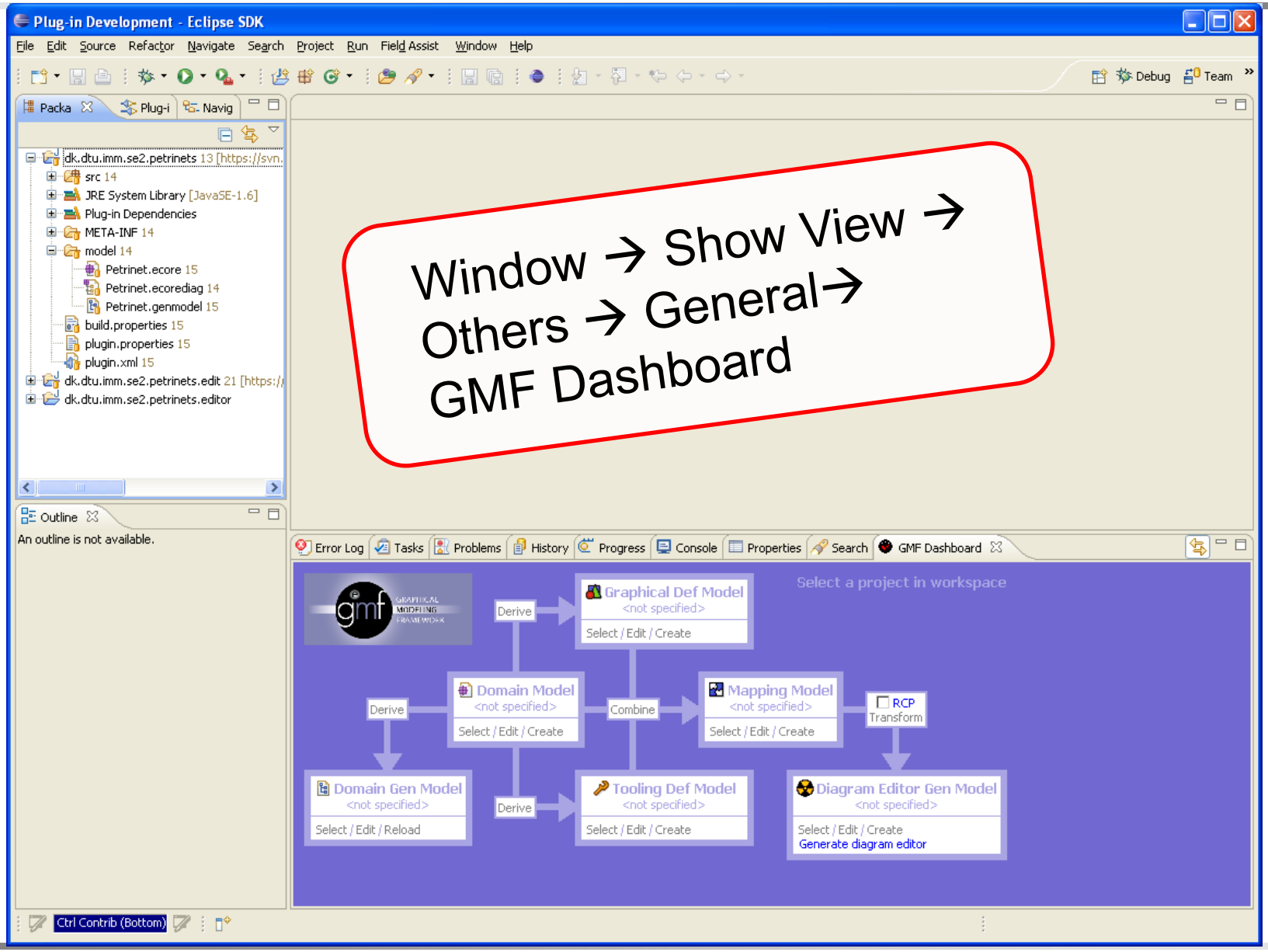
generate an editor





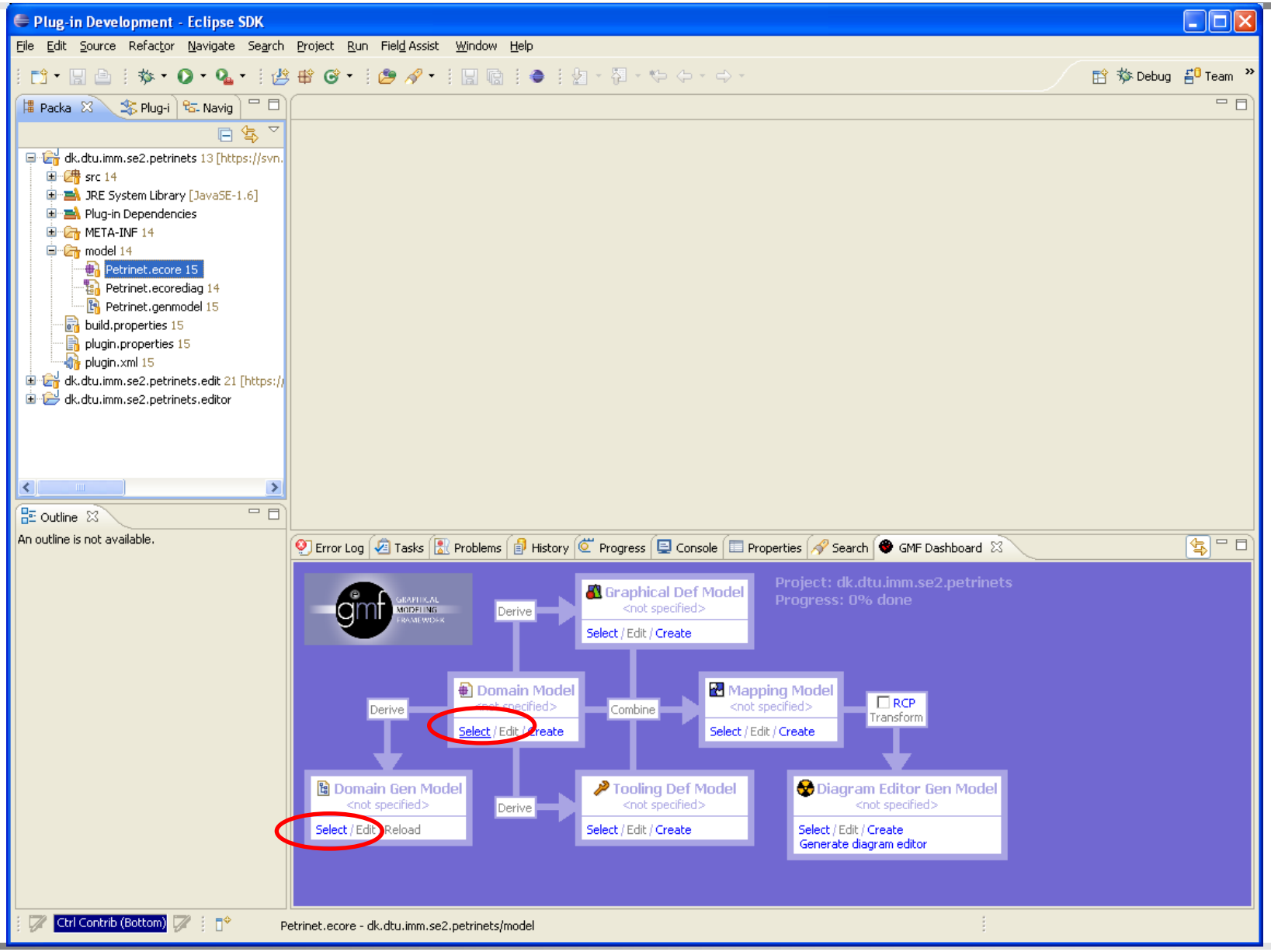
Open GMF Dashboard

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler

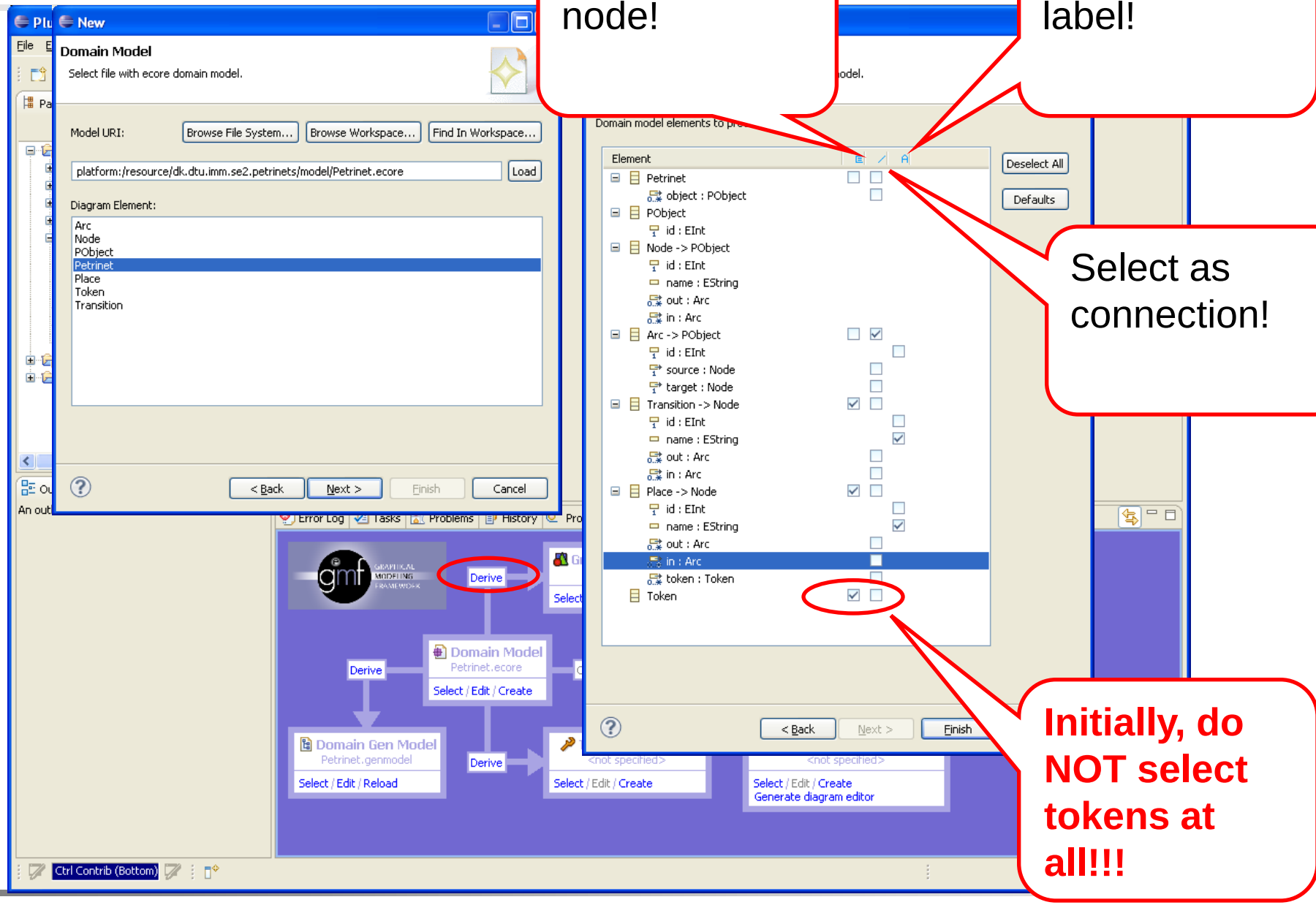


Select Model and Genmodel

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler

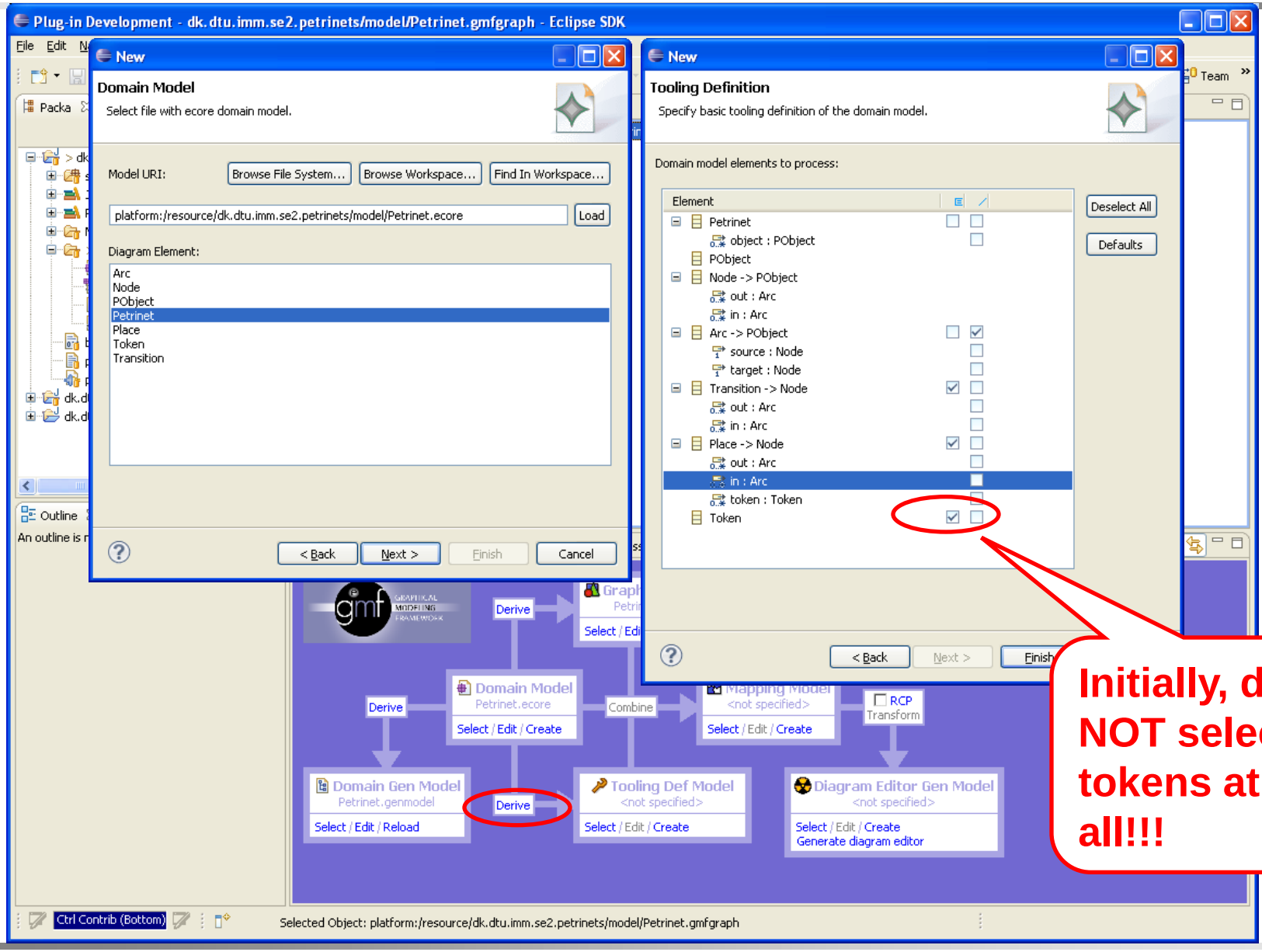


Create GraphDefModel



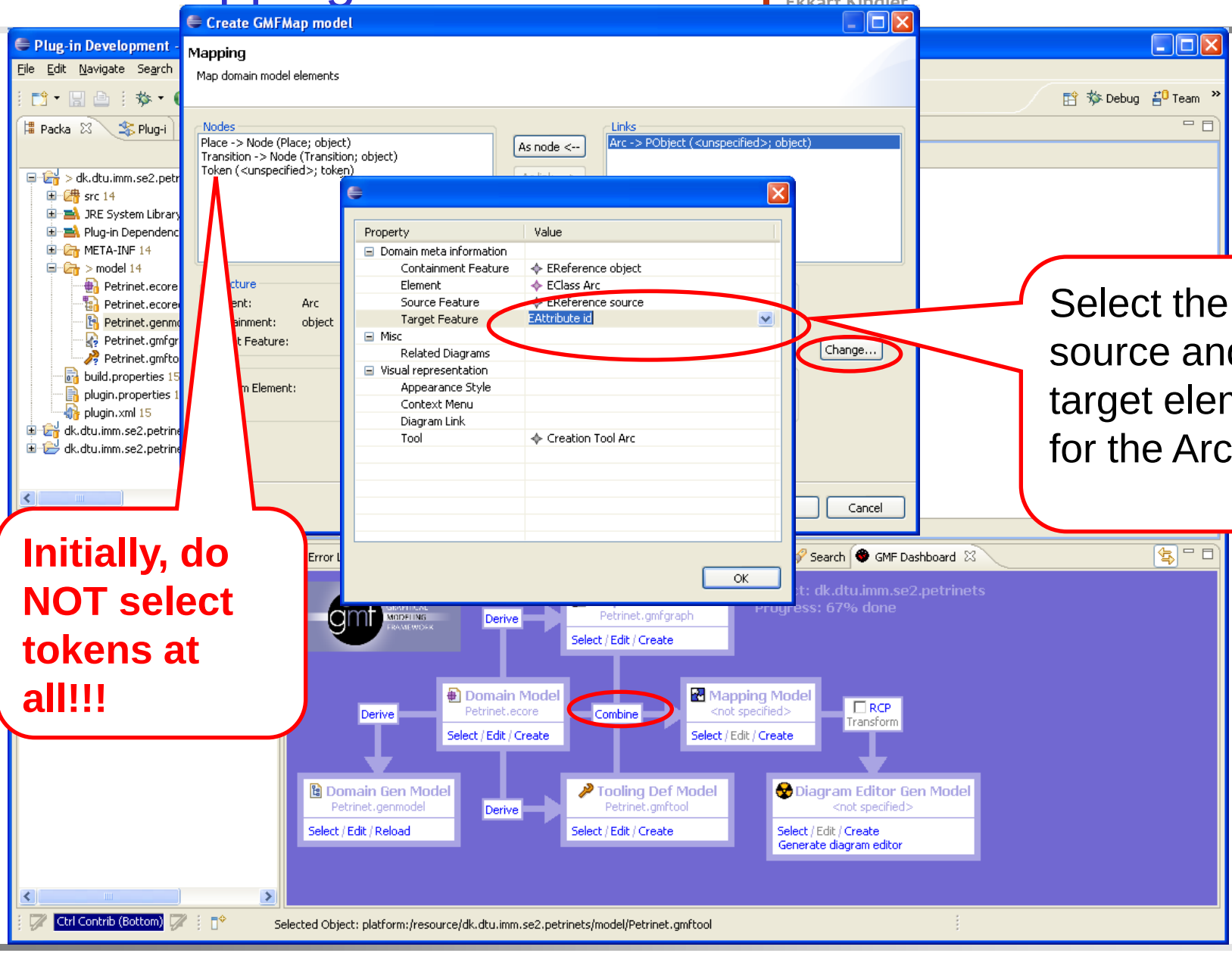
Create ToolingDefModel

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler



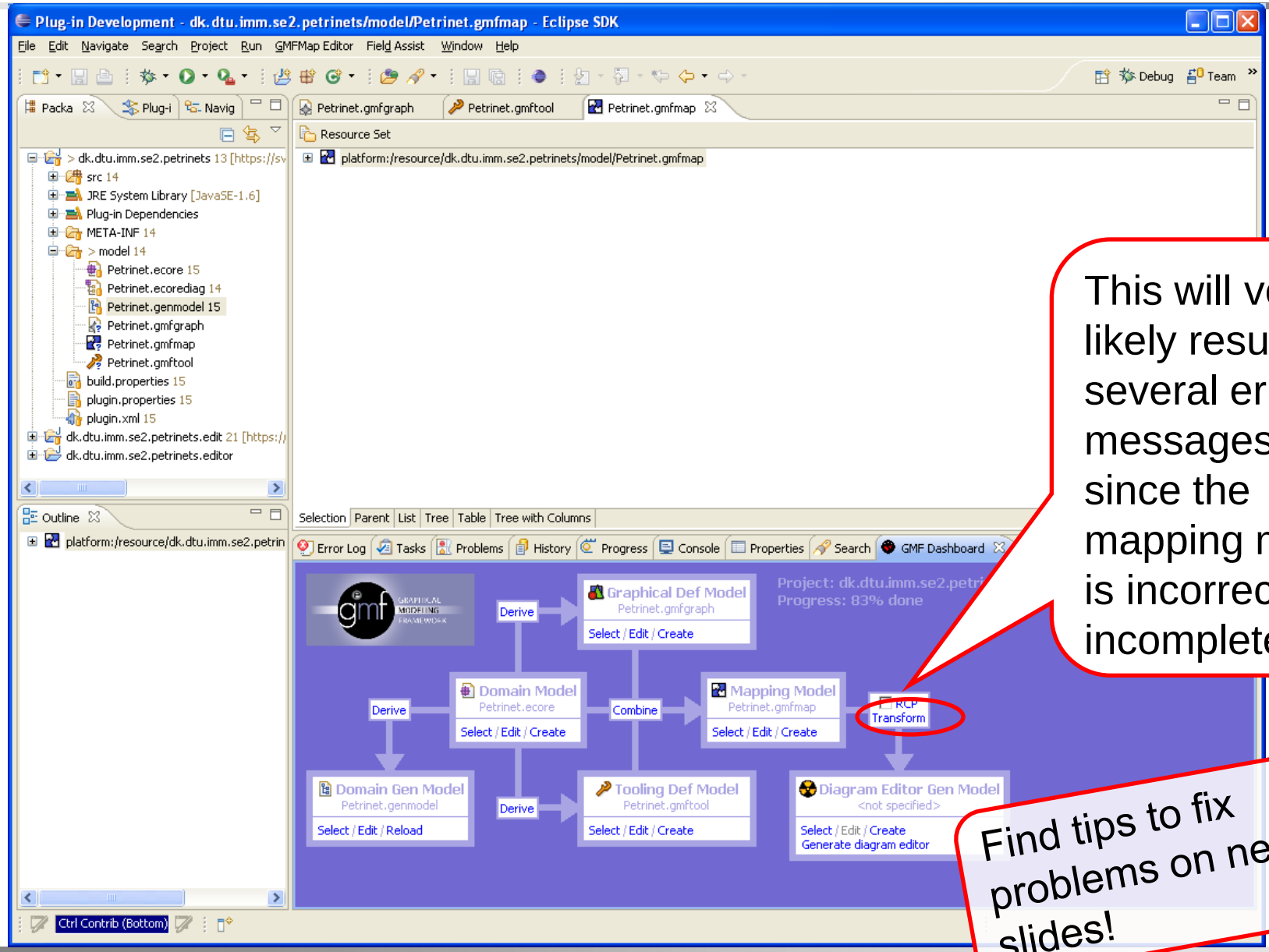
Create MappingModel

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler



Create GraphGenmodel

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler

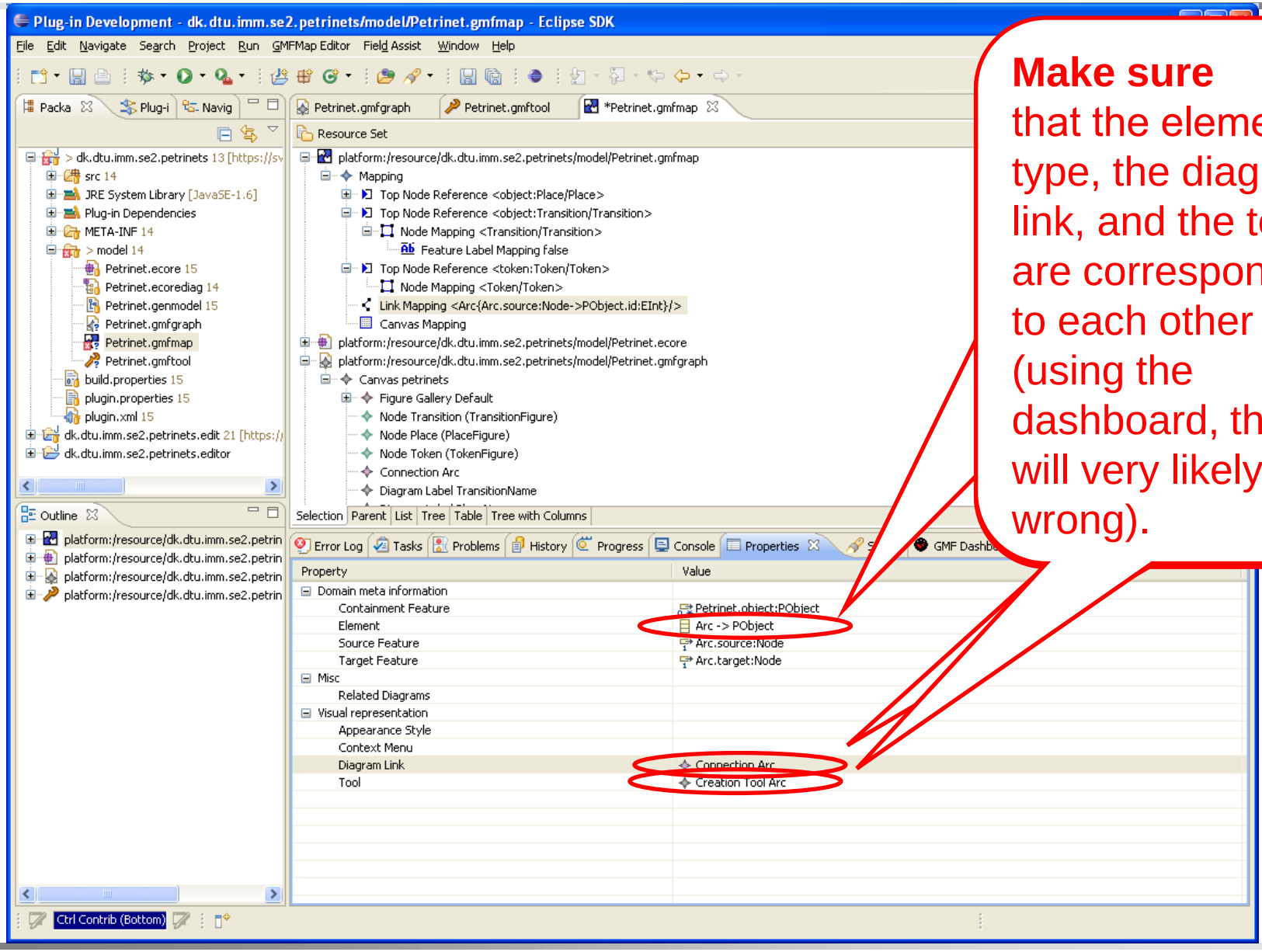


This will very likely result in several error messages, since the mapping model is incorrect or incomplete!

Find tips to fix problems on next slides!

In .gmfmap: Align graphics, tool and type

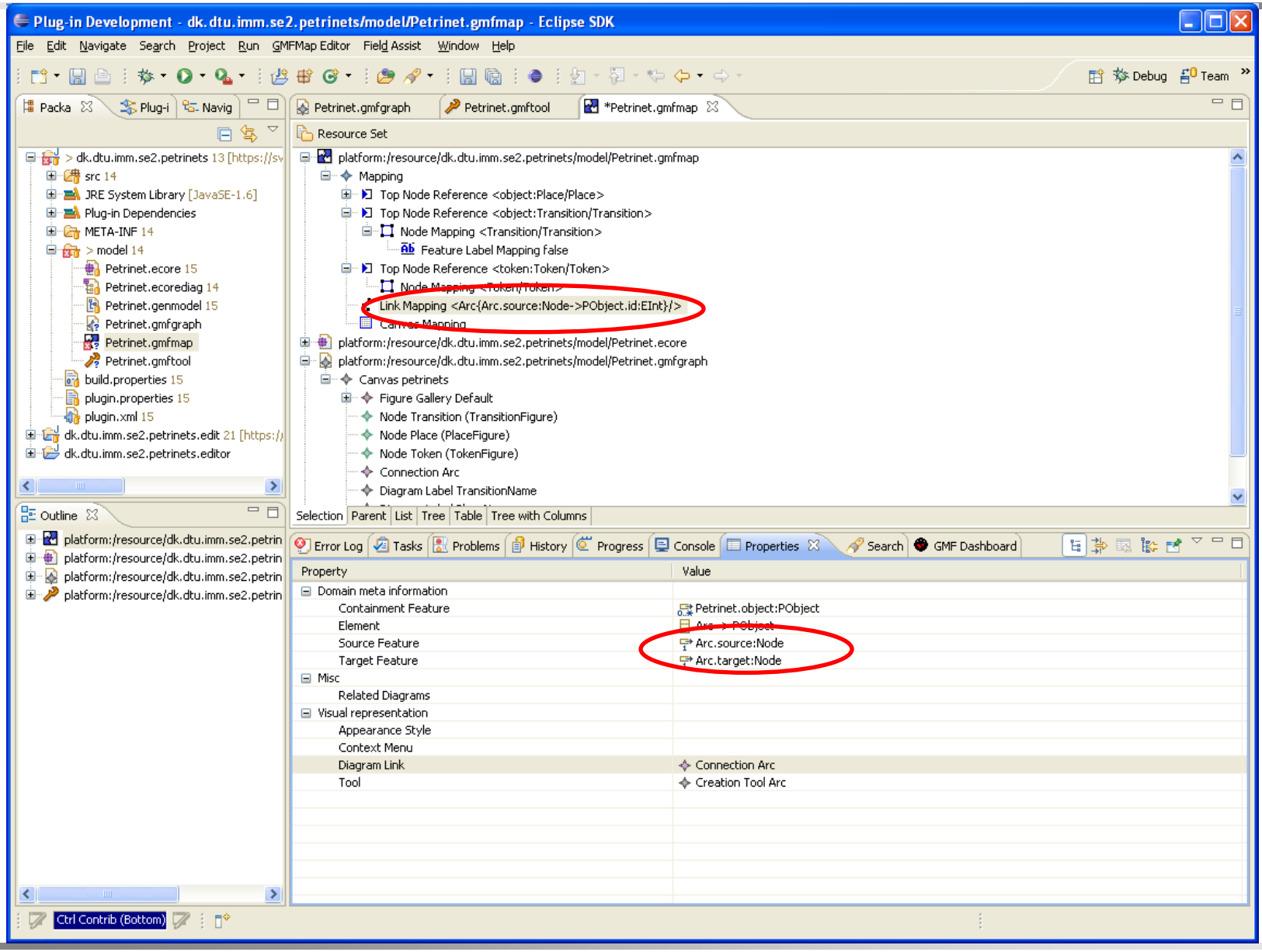
DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler



Make sure
that the element's type, the diagram link, and the tool are corresponding to each other (using the dashboard, they will very likely be wrong).

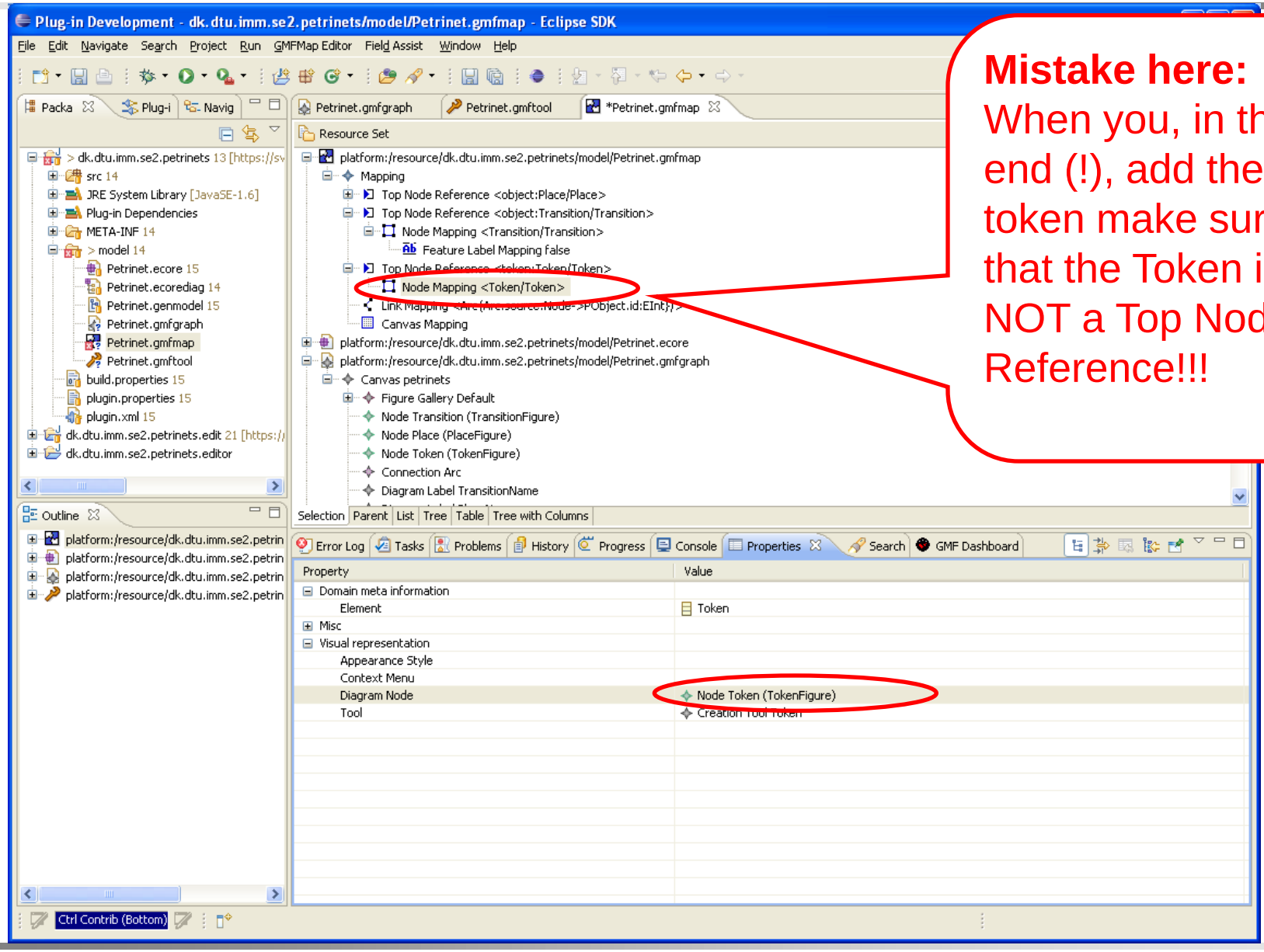
Some changes in MapModel

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler



Some changes in MapModel

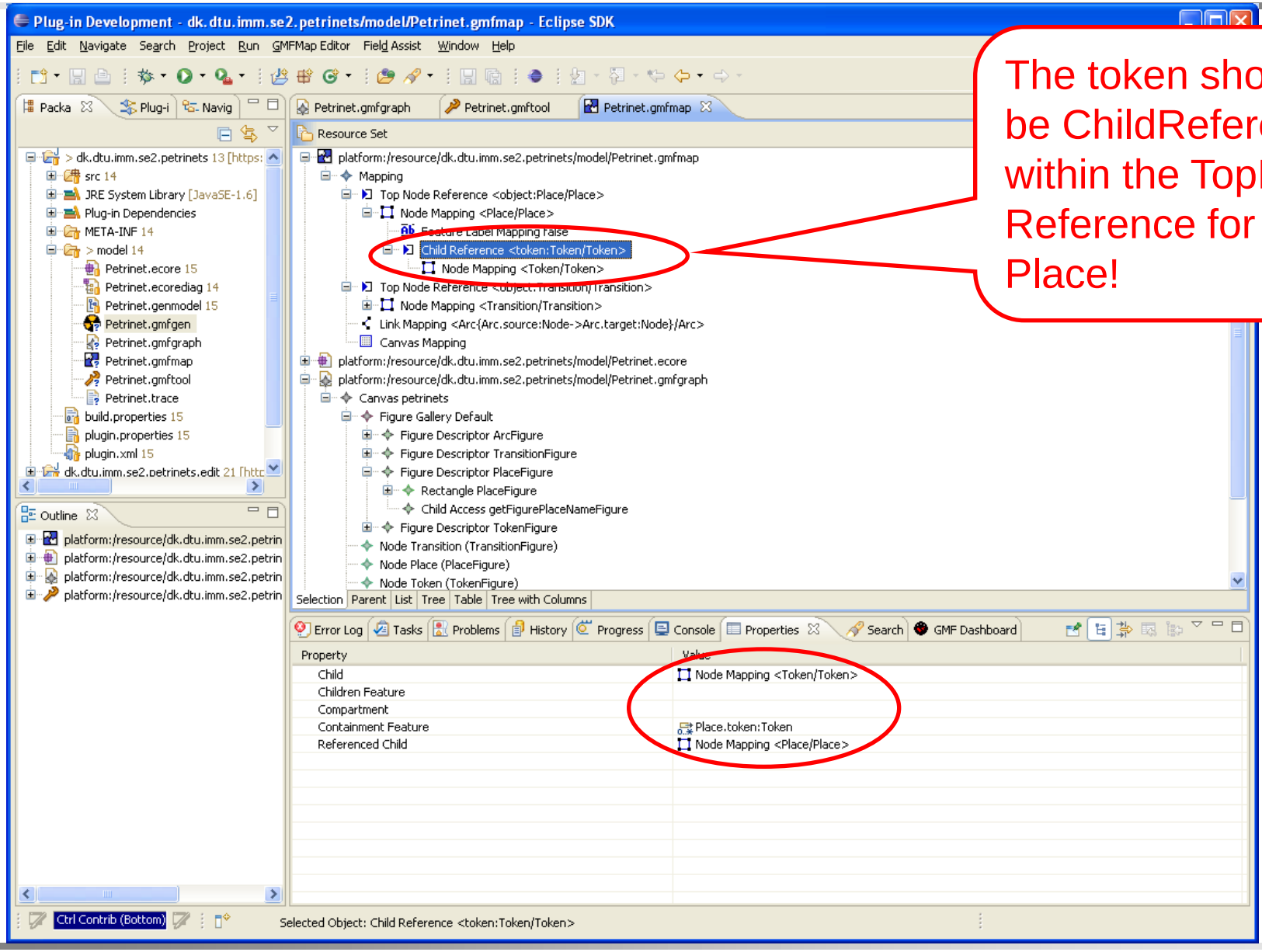
DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler



Mistake here:
When you, in the end (!), add the token make sure that the Token is NOT a Top Node Reference!!!

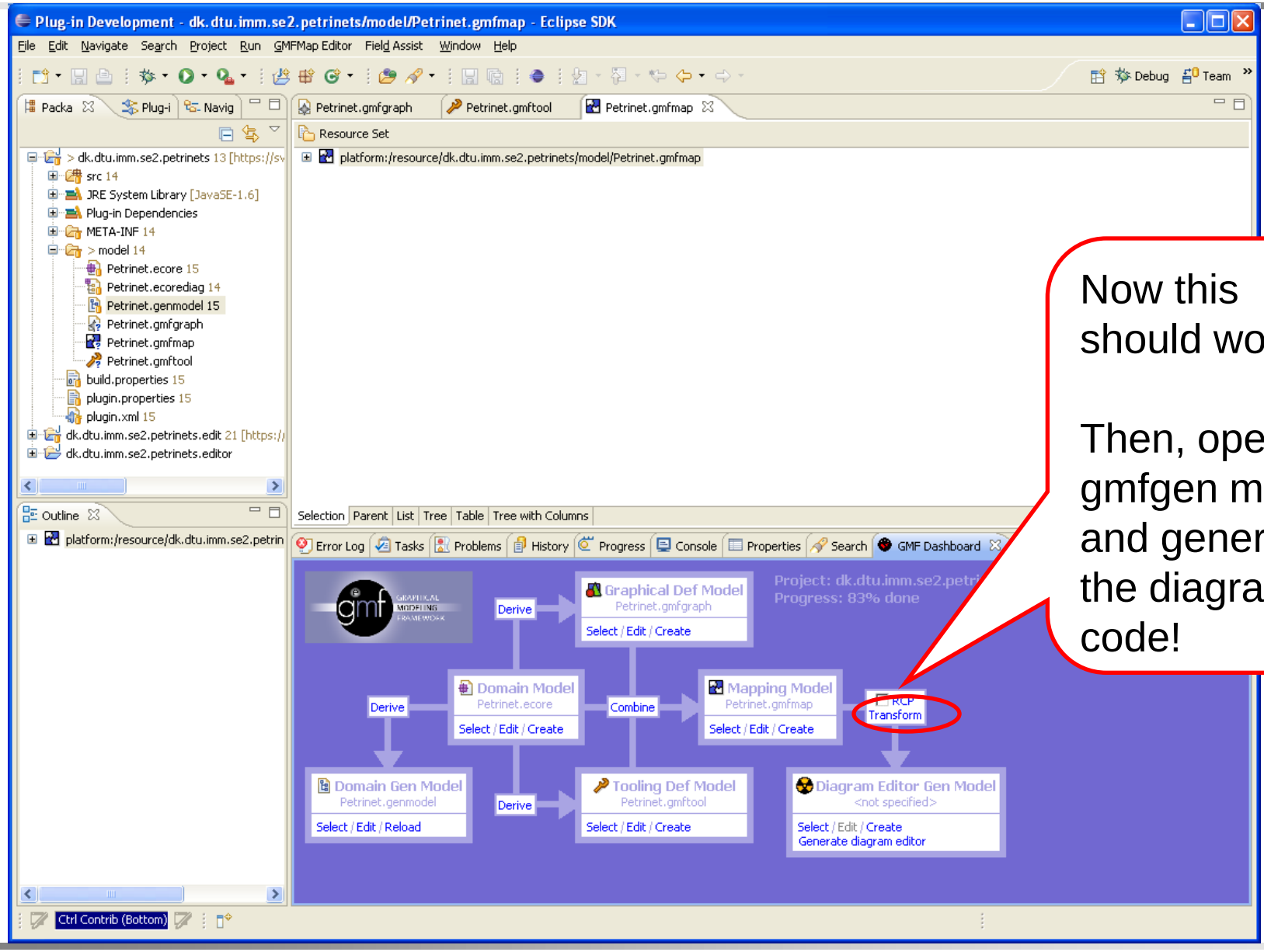
Make Token a Child Reference

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler



Select Model and Genmodel

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler

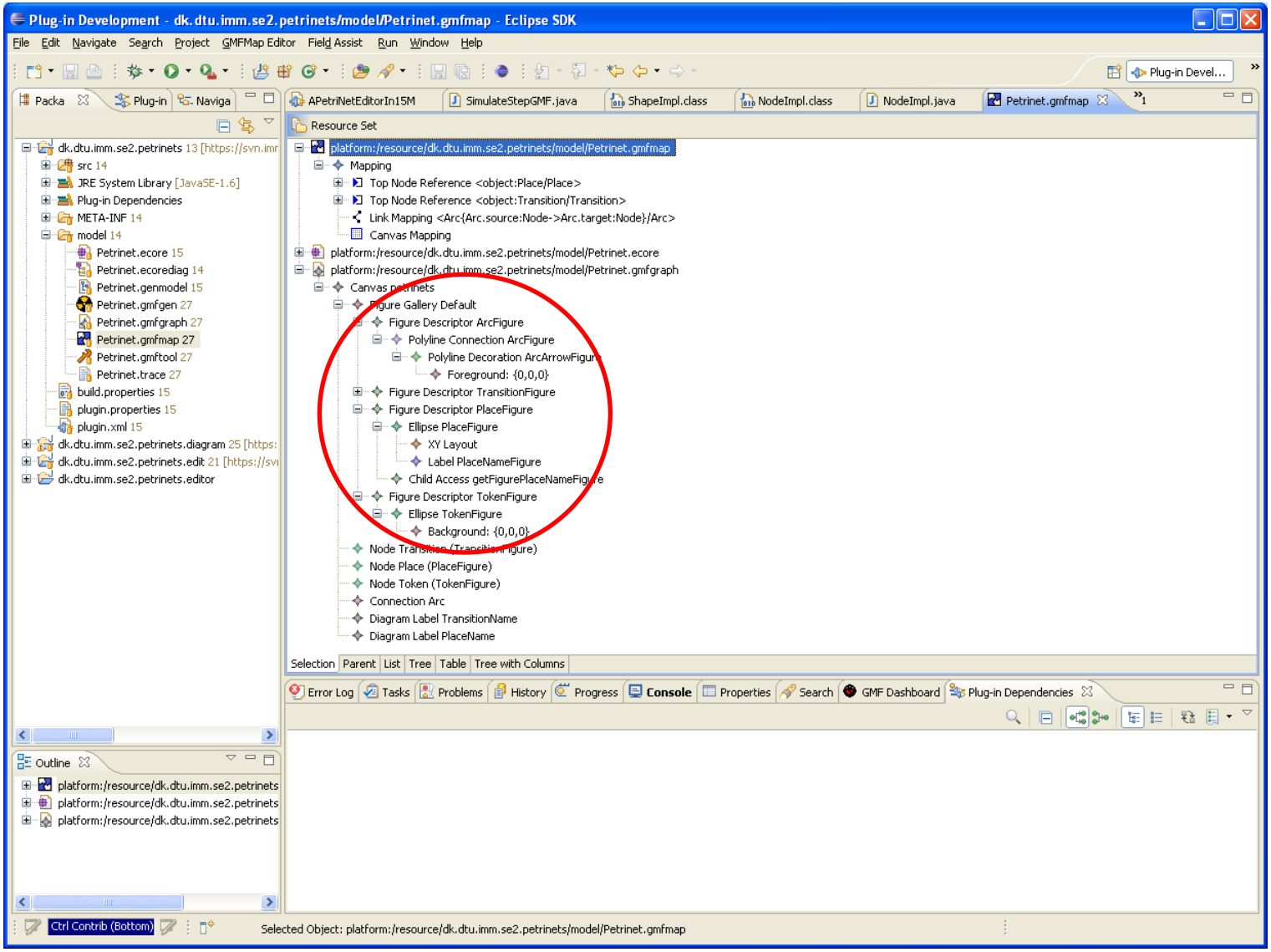


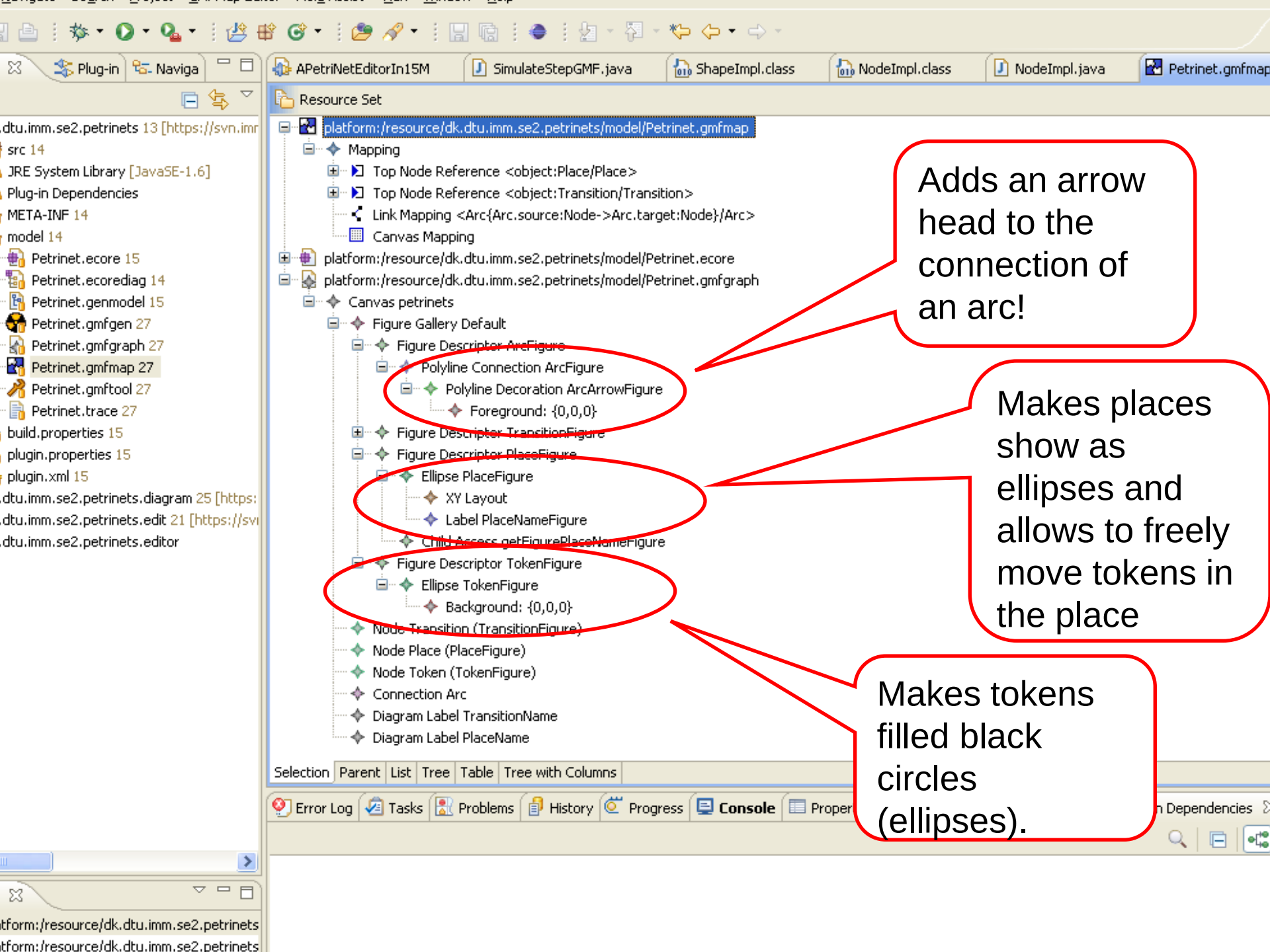
Now this should work!

Then, open the gmfgen model and generate the diagram code!

”Nicyfying” graphics

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler

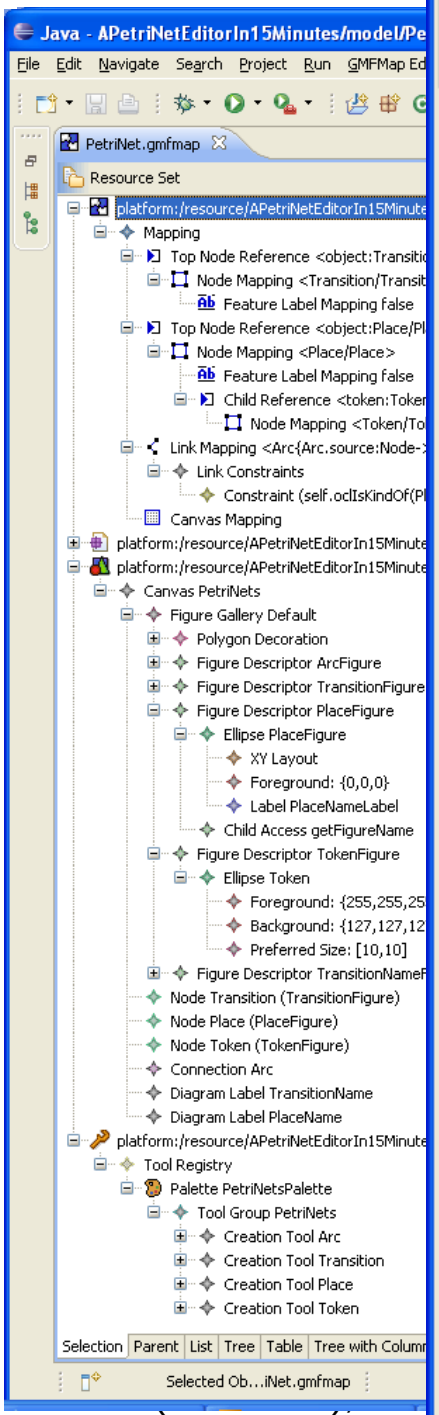



Plug-in
Naviga
APetriNetEditorIn15M
SimulateStepGMF.java
ShapeImpl.class
NodeImpl.class
NodeImpl.java
Petrinet.gmfmap
Resource Set
dtu.imm.se2.petrinets 13 [https://svn.imr
src 14
JRE System Library [JavaSE-1.6]
Plug-in Dependencies
META-INF 14
model 14
Petrinet.ecore 15
Petrinet.ecorediag 14
Petrinet.genmodel 15
Petrinet.gmfgen 27
Petrinet.gmfgraph 27
Petrinet.gmfmap 27
Petrinet.gmftool 27
Petrinet.trace 27
build.properties 15
plugin.properties 15
plugin.xml 15
dtu.imm.se2.petrinets.diagram 25 [https:
dtu.imm.se2.petrinets.edit 21 [https://svi
dtu.imm.se2.petrinets.editor
platform:/resource/dk.dtu.imm.se2.petrinets/model/Petrinet.gmfmap
Mapping
Top Node Reference <object:Place/Place>
Top Node Reference <object:Transition/Transition>
Link Mapping <Arc{Arc.source:Node->Arc.target:Node}/Arc>
Canvas Mapping
platform:/resource/dk.dtu.imm.se2.petrinets/model/Petrinet.ecore
platform:/resource/dk.dtu.imm.se2.petrinets/model/Petrinet.gmfgraph
Canvas petrinets
Figure Gallery Default
Figure Descriptor ArcFigure
Polyline Connection ArcFigure
Polyline Decoration ArcArrowFigure
Foreground: {0,0,0}
Figure Descriptor TransitionFigure
Figure Descriptor PlaceFigure
Ellipse PlaceFigure
XY Layout
Label PlaceNameFigure
Figure Descriptor TokenFigure
Ellipse TokenFigure
Background: {0,0,0}
Node Transition (TransitionFigure)
Node Place (PlaceFigure)
Node Token (TokenFigure)
Connection Arc
Diagram Label TransitionName
Diagram Label PlaceName
Selection
Parent
List
Tree
Table
Tree with Columns
Error Log
Tasks
Problems
History
Progress
Console
Dependencies
Adds an arrow head to the connection of an arc!
Makes places show as ellipses and allows to freely move tokens in the place
Makes tokens filled black circles (ellipses).

What was created

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler

1. Graph model (.gmfgraph):
   Defining the graphical elements and appearance of the Petri net
2. Tooling model (.gmftool):
   Defining the tools in the toolbar (basically)
3. Mapping model (.gmfmap):
   Mapping the model elements to the graphical ones (and the tools)
4. Generator model (.gmfgen):
   Some information for code generation (similar to EMF .genmodel)



Resource Set

platform:/resource/APetriNetEditorIn15Minutes/model/PetriNet.gmfmap

- Mapping
  - Top Node Reference <object:Transition/Transition>
    - Node Mapping <Transition/Transition>
      - Feature Label Mapping false
  - Top Node Reference <object:Place/Place>
    - Node Mapping <Place/Place>
      - Feature Label Mapping false
      - Child Reference <token:Token/Token>
        - Node Mapping <Token/Token>
  - Link Mapping <Arc{Arc.source:Node->Arc.target:Node}/Arc>
    - Link Constraints
      - Constraint (self.oclIsKindOf(Place) and oppositeEnd.oclIsKindOf(Transition)) or...
  - Canvas Mapping

platform:/resource/APetriNetEditorIn15Minutes/model/PetriNet.ecore

platform:/resource/APetriNetEditorIn15Minutes/model/PetriNet.gmfgraph

- Canvas PetriNets
  - Figure Gallery Default
    - Polygon Decoration
    - Figure Descriptor ArcFigure
    - Figure Descriptor TransitionFigure
    - Figure Descriptor PlaceFigure
      - Ellipse PlaceFigure
        - XY Layout
        - Foreground: {0,0,0}
        - Label PlaceNameLabel
      - Child Access getFigureName
    - Figure Descriptor TokenFigure
      - Ellipse Token
        - Foreground: {255,255,255}
        - Background: {127,127,127}
        - Preferred Size: [10,10]
    - Figure Descriptor TransitionNameFigure
  - Node Transition (TransitionFigure)
  - Node Place (PlaceFigure)
  - Node Token (TokenFigure)
  - Connection Arc
  - Diagram Label TransitionName
  - Diagram Label PlaceName

platform:/resource/APetriNetEditorIn15Minutes/model/PetriNet.gmftool

- Tool Registry

Important tip:

When your want to change the .gmfgraph, .gmftool or , .gmfmap model, **ALWAYS** do this be opening the .gmfmap file! Otherwise you might destroy the consistency between these files!!

More details in discussion in the

Assignment 3:

DTU Compute
Department of Applied Mathematics and Computer Science
Ekkart Kindler

1. Create a simple graphical editor on top of your Petri net model (ignore tokens for now)!
   a) Create the different GMF models with the help of the GMF Dashboard
   b) Have a look at the generated files (and fix possible errors)
   c) Generate the code for the graphical editor and check whether it works

2. The GMF Dashboard does not allow you (in a straight-forward way) to make places show as ellipses. Change the .gmfgraph model manually to make places show as ellipses!

3. Add tokens to the editor: To this end, change the files .gmfgraph, .gmftool, and .gmfmap (in the .gmfmap tokens a ”submapping” of the mapping for places (see slides 11/12).