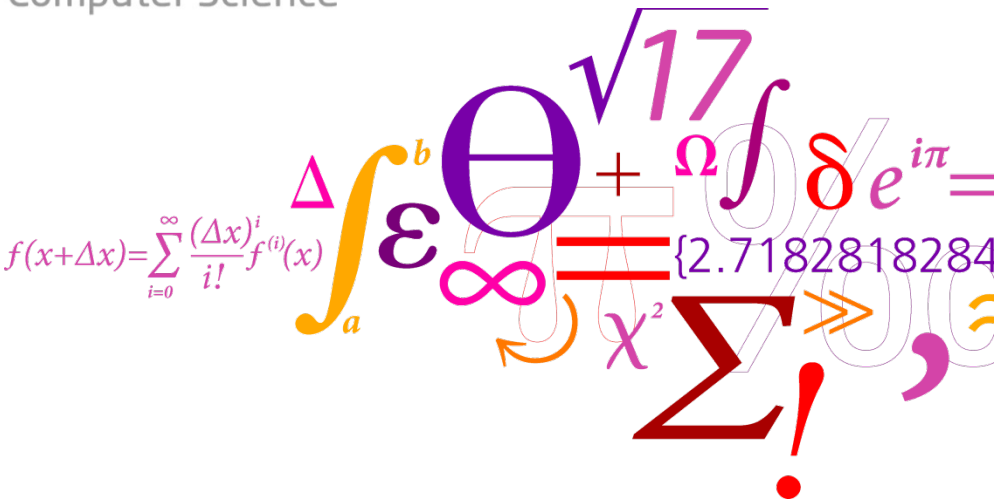
The ePNK: Hands-on / Project

Ekkart Kindler

DTU Compute
Department of Applied Mathematics and Computer Science



Task

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runtime-EclipseApplication - /resource/org.pnml.tools.epnk.tutorials.pn-mbse.testit/model/second.pnml/#pg1 - Eclipse Platform

File Edit Diagram Navigate Search Project Run Window Help

Project Explorer
- JETEmitters
- org.pnml.tools.epnk.tutorials.pn-mbse.testit
  - JRE System Library [jdk-12.0.1]
  - Plug-in Dependencies
  - src
  - META-INF
  - model
    - first.pnml
    - second.pnml
  - .classpath
  - .project
  - build.properties

second.pnml | Page (id): pg1

int x = 0;

t0 — x = 0; → p1 (1)

p1 → t1 — x < 5 — System.out.println("x = " + x); x++; → p2

p1 → t4 → p2

p2 → t2 — System.out.println("x = " + x);

Palette: Place, Transition, Arc, Page, RefPlace, RefTransition, Label, Link Label, Page Label

Tasks | Properties | Problems | Console | ePNK: Applications

Label

Core | Appearance

Property	Value
Label	Action System.out.println("x = " + x);x++;
Object	Transition Code t1
Text	System.out.println("x = " + x);...

Outline

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t4

t2 — System.out.println("x = " + x);

p2

Action

Palette: Page, RefPlace, RefTransition, Label, Link Label, Page Label

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Condition

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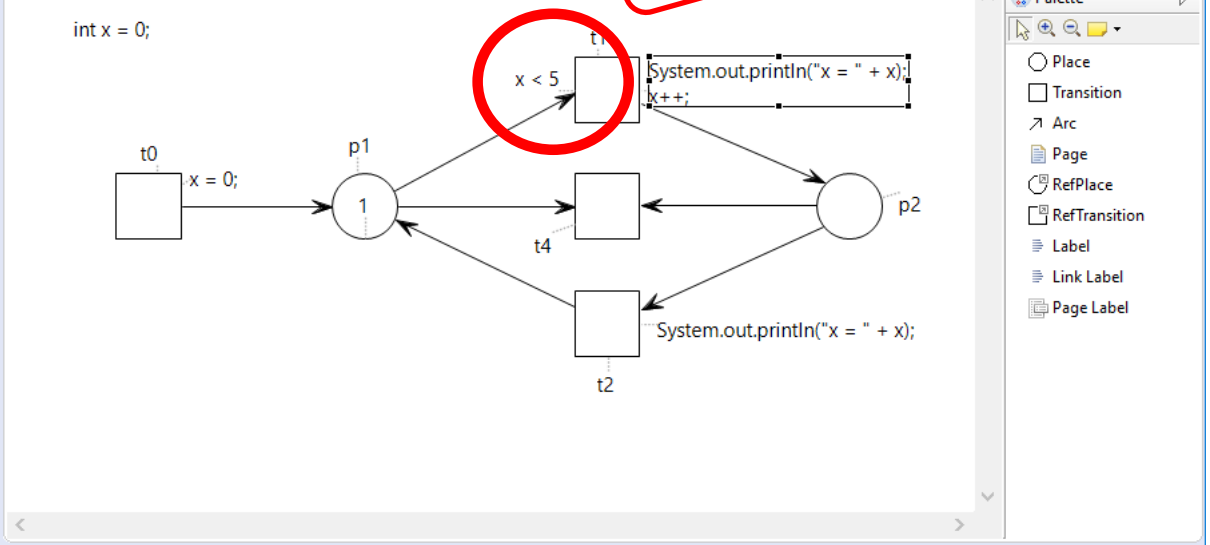
second.pnml | Page (id): pg1



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File Edit Diagram Navigate Search Project Run Window Help

Declaration

int x = 0;

t0 x = 0; p1 1 t1 x < 5 System.out.println("x = " + x); x++; t4 p2 t2 System.out.println("x = " + x);

Palette: Place, Transition, Arc, Page, RefPlace, RefTransition, Label, Link Label, Page Label

Project Explorer: JETEmitters, org.pnml.tools.epnk.tutorials.pn-mbse.testit, JRE System Library [jdk-12.0.1], Plug-in Dependencies, src, META-INF, model, first.pnml, second.pnml, .classpath, .project, build.properties

Outline

Tasks | Properties | Problems | Console | ePNK: Applications

Label

Core | Appearance

Property	Value
Label	Action System.out.println("x = " + x);x++;
Object	Transition Code t1
Text	System.out.println("x = " + x);...

Step 1: PNTD

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- Implement a new Petri net type extending PTNets (a PNTD for what we call PNCode) by adding
  - Action(label)s to transitions
  - Condition(label)s to transitions
  - Declaration(label)s to pages

- These concepts should be text in Java syntax
- For now, it is not necessary to check syntactical correctness of this syntax
- A basic project with a set up of a simple model is provided to you (see slides on details later)

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Right-click (on type PNCode):
→ ePNK
→ Generate Java Code from PNCode

runtime-EclipseApplication - org.pnml.tools.epnk.tutorials.pn-mbse.testit/model/second.pnml - Eclipse Platform

File Edit Navigate Search Project ePNK Editor Run Window Help

Project Explorer
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second.pnml | Page (id): pg1

Resource Set
- platform:/resource/org.pnm
- Petri Net Doc
- PN Code
- Name Secon
- Page Code pg1

Save Java code...

Please select a folder to which the generated java code should go.
- JETEmitters
- org.pnml.tools.epnk.tutorials.pn-mbse.testit
  - bin
  - META-INF
  - model
  - src

New Folder...

OK Cancel

Selection Parent List Tree

Tasks Properties

Property

Outline
- platform:/resource/org.pnml.tools.epnk.tuto

Selected Object: PN Code

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runtime-EclipseApplication - org.pnml.tools.epnk.tutorials.pn-mbse.testit/src/Second.java - Eclipse Platform

File Edit Source Refactor Navigate Search Project Run Window Help

Project Explorer

- JETEmitters
- org.pnml.tools.epnk.tutorials.pn-mbse.te
  - JRE System Library [jdk-12.0.1]
  - Plug-in Dependencies
  - src
    - (default package)
      - Second.java
        - Second
          - main(String[]) : void
          - x
          - Second()
          - enabled(int) : boolean
          - fire(int) : void
  - META-INF
  - model
    - first.pnml
    - second.pnml
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second.pnml | Page (id): pg1 | Second.java

```
// package using default package for now!

import org.pnml.tools.epnk.tutorials.pnmbse.codegenerator.runtime.AbstractPetrinet;

public class Second extends AbstractPetrinet {

// PNCode declarations
int x = 0;


    public Second() {
        super(new int[]{1, 0}, new String[]{"t1", "t2", "t0", "t4"} );
    }

    public boolean enabled(int t) {
        switch (t) {
        case 0:
            return marking[0] >= 1 && x < 5;

        case 1:
            return marking[1] >= 1;

        case 2:
            return true;

        case 3:
            return marking[0] >= 1 && marking[1] >= 1;

        default:
            return false;
        }
    }

    public void fire(int t) {
        if (!enabled(t))
            return;

        switch (t) {
        case 0:
            marking[0] =  marking[0] - 1;
            marking[1] =  marking[1] + 1;
            System.out.println("x = " + x);
x++;
            break;

        case 1:
```

Second.java - org.pnml.tools.epnk.tutorials.pn-mbse.testit/src

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Right-click:
→ Run As
→ Java Application

runtime-EclipseApplication - org.pnml.tools.epnk.tutorials.pn-mbse.testit/src/Second.java - Eclipse Platform

File Edit Source Navigate Search Project Run Window Help

Quick Access

Project Explorer

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Second.java

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        case 2:
            return true;

        case 3:
            return marking[0] >= 1 && marking[1] >= 1
```

Petri nets: Execution Environment

Second: 1

Stop | t1 | t2 | t0 | t4

Tasks | Properties | Problems | Console | ePNK: Applications

Second [Java Application] C:\Users\ekki\eclipse\4.11\jdk-12.0.1\bin\javaw.exe (17. jun. 2019 19.13.27)

x = 0
x = 1

Outline

- Second
  - x : int
  - Second()
  - enabled(int) : boolean
  - fire(int) : void
  - main(String[]) : void

Second.java - org.pnml.tools.epnk.tutorials.pn-mbse.testit/src

Step 2: Code Generator

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- Implement an action that generates Java code from such PNCode running as a Java application

- The GUI and “runtime” environment as well as all to the set up the action and initiate the code generation is provided to you
- Also a generator template for the basic Petri net (not taking actions, conditions and declarations into account) is provided to you
- You can focus on **extending the template and skeleton for generating the code for actions, conditions and declarations**