Week 4: Petri Nets

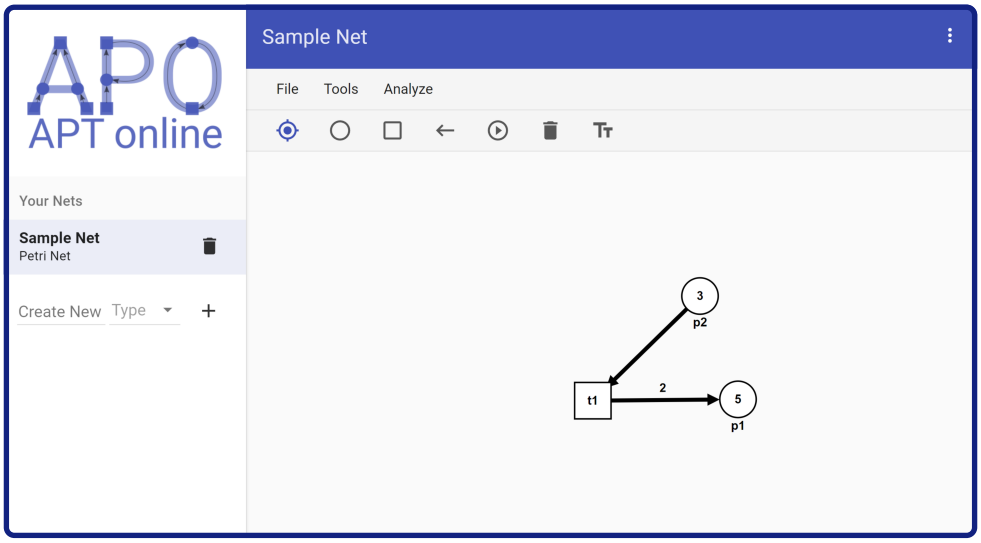
APO - APT ONLINE

Last updated: 19.02.2024

TOOL

APO	https://apo.adrian-jagusch.de/#!/Example

This document provides a guide for APO
on the creation and analysis of Petri Nets.



TOOLBAR (FOR PETRI NETS)

The toolbar for Petri Nets consist of the seven tools listed below.

Places
Select the *place* tool and click on the canvas to add a place.

Transitions
Select the *transition* tool and click on the canvas to add a transition.

Fix Nodes
Select the *Fix Nodes* tool and click on a node to fix it to the canvas. Double-click on the node to free it again.

Arrows
Select the *Arrows* tool and drag the cursor between two nodes of different types to create an edge from the first selected node to the other. Adding another edge between the two nodes will transform the existing edge to a bidirectional edge*.
If the second edge is added in the same direction as the existing one, the weights in both directions will be set to 1. Hence, the second edge must be added in the opposite direction in order to keep the first edge's weight.
Modeling multiple edges in the same direction can be done by changing the weight of an edge with the *Labels* tool.

* A bidirectional edge cannot be transformed to a directional edge, but must be deleted and a new edge must be created.

Labels
Select the *Labels* tool and
1. click on a node to rename it, or
2. click on an edge to change its weight.

Tokens
Select the *Tokens* tool and
1. click on a place to change the number of tokens in that place or
2. click on a green transition to fire it*.

* A red transition cannot be fired.

Delete
Select the *Delete* tool and click on a node or an edge to delete it. If the UI does not update correctly after deletion of a node or an edge, try to refresh the page.

ANALYSIS - PROPERTIES AND COVERAGE GRAPH

Petri Net Analysis
Go to *Analyze* > *Petri Net Analysis* to see the properties of the opened Petri Net*.

* When the Petri Net Analysis modal opens, the *START TESTS* button will start the tests that will return the properties, which will then be displayed in the modal. Clicking on *START TESTS* again will not have any effect.

Coverability Graph
Go to *Analyze* > *Coverability Graph* to compute a coverability graph from the opened Petri Net. When the coverability graph is generated it will be shown in the list on the left-hand side.

EXPORT AND IMPORT

Export APT
Go to *File* > *Export APT* to download or copy the APT code.

```
.name "Sample Net"
.type PN

.places
p1
p2

.transitions
t1

.flows
t1: {1*p2} → {2*p1}

.initial_marking {5*p1, 3*p2}
```

Import APT
Go to *File* > *Import APT* to import a Petri Net (APT format) from your file system or from APT code*. Uncheck “Normalize APT Code before import”.

* APO will close the modal without updating if the APT code has errors.