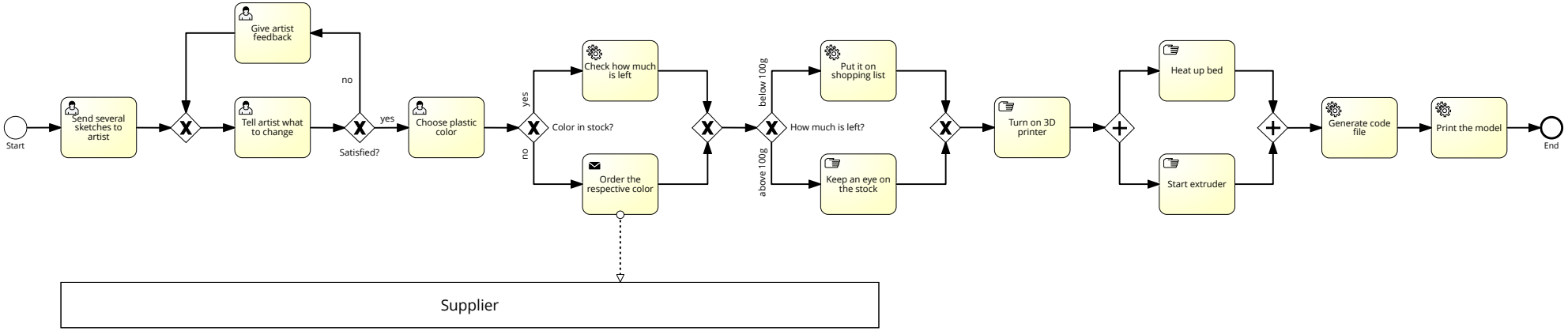
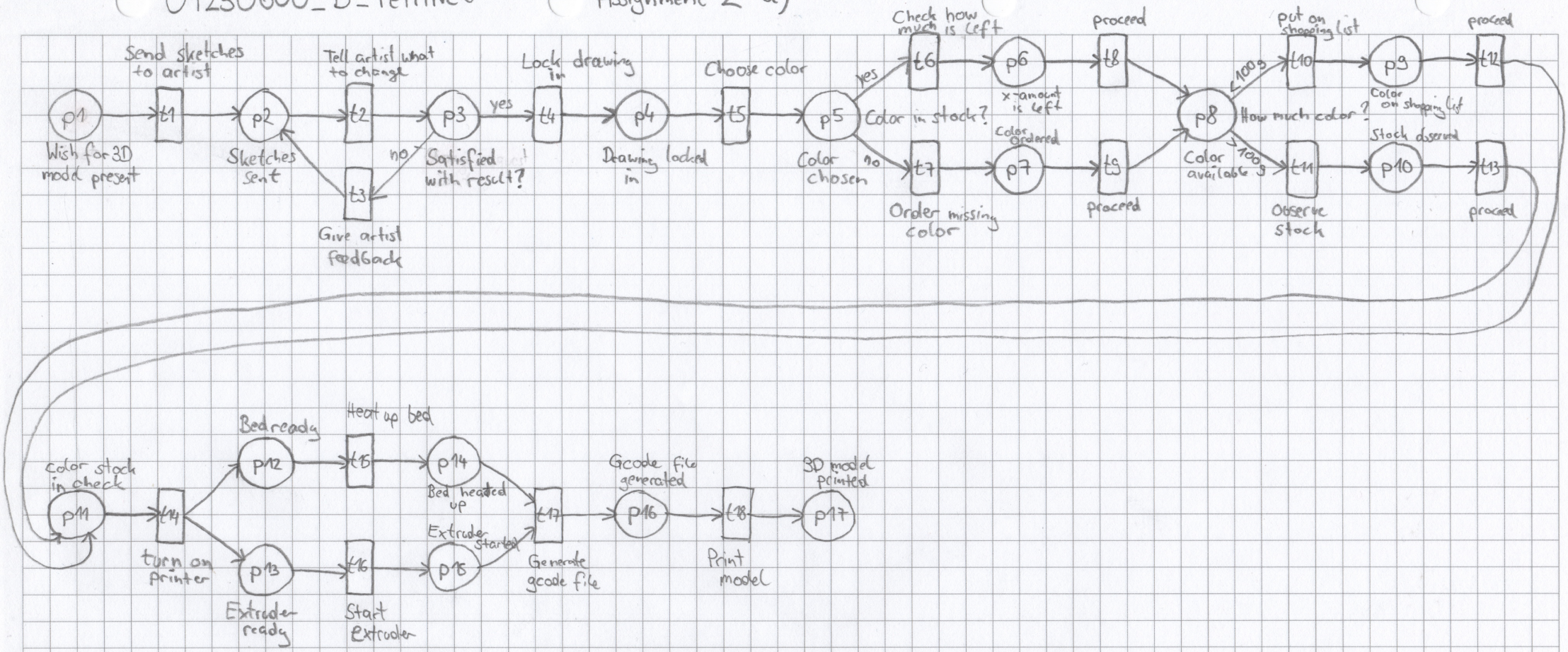
01250600_B_BPMN



01250600_B_PetriNet Assignment 2 a)



Q: What net type and why?

I chose to model my model B from assignment 1 as a E/C net. The reason for doing so derives from the fact that petri nets of the E/C type are natively (if modeled correct) sound. As it is mandatory to have a petri net that is structurally sound in assignment 2 d), I thought it would safe me time and efford if I already consider this property at the very beginning. There was no need for weighed arcs or places that may hold more then one token.

Assignment 2

(b) Analysis

Reachability analysis of petri net 2a:

No.	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	p11	p12	p13	p14	p15	p16	p17	Firing transition
M0	1																	t1 -> M1
M1		1																t2 -> M2
M2			1															t3 -> M1, t4 -> M3
M3				1														t5 -> M4
M4					1													t6 -> M5, t7 -> M6
M5						1												t8 -> M7
M6							1											t9 -> M7
M7								1										t10 -> M8, t11 -> M9
M8									1									t12 -> M10
M9										1								t13 -> M10
M10											1							t14 -> M11
M11												1	1					t15 -> M12, t16 -> M13
M12													1	1				t16 -> M14
M13												1			1			t15 -> M14
M14														1	1			t17 -> M15
M15																1		t18 -> M16
M16																	1	End

Interpret your results and discuss whether your model is

**** sound***

As defined in the lecture process models are structurally sound if there is exactly one initial node, one end node and each node is on the path from initial to end.
*The petri net is sound, as it is safe, i.e., no place holds more than one token. The aspect of proper completion is given as there are no token left when the sink place (p17) is marked (M16). The option to complete, as seen in M16, is fulfilled. There is an absence of dead parts of the model, every transition can be fired along the firing sequence.

*The soundness considerations and explanations are based upon the soundness definition from Wil van der Aalst and his book “Process Mining: Data Science in Action” second edition, Springer. (p. 65-66)

**** bounded***

The model is 1-bounded aka safe. M0 – M16

**** safe***

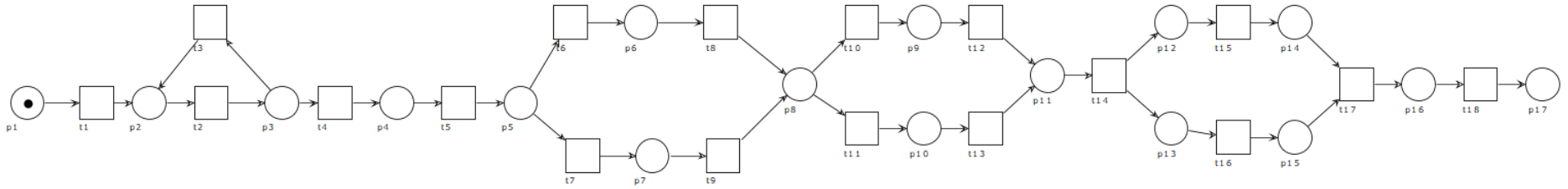
The model is 1-bounded aka safe. M0 – M16

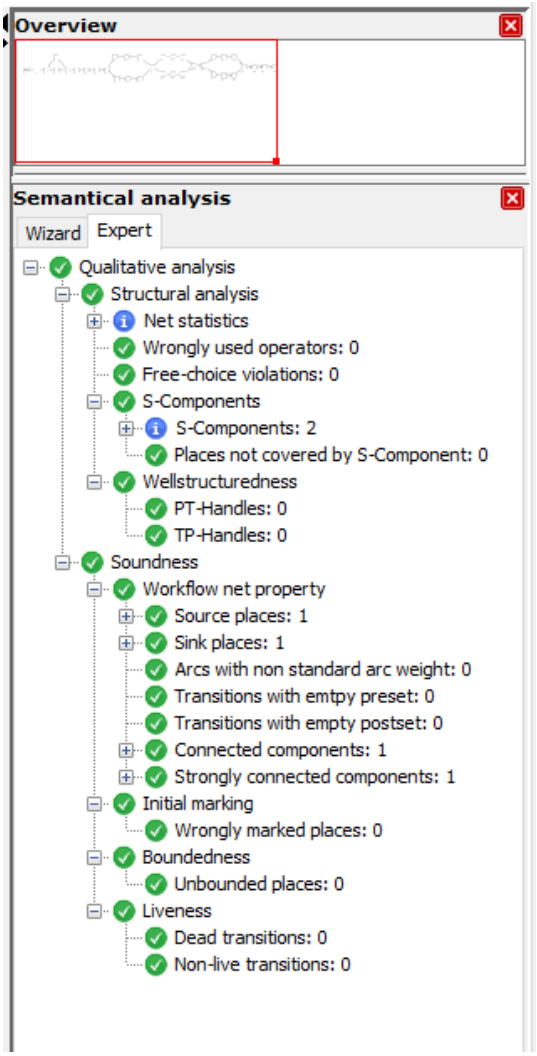
*** and *live***

The petri net is not live. When the final marking M16 is reached there is no possibility to redo parts / the whole net, there are no transitions that are enabled. We’d have to introduce an additional transition, let’s call it *t’* that connects p1 and p17 to make the model live.

Assignment 2

(c) Analysis via Tool Support – Part 1





Interpret your results and discuss whether your model is

*** sound**
Here the tool analysis and my manual analysis come to the same conclusion. The Petri net has a starting point (the source) and an end point (the sink). Every transition can be performed along the way from initial node and end node.

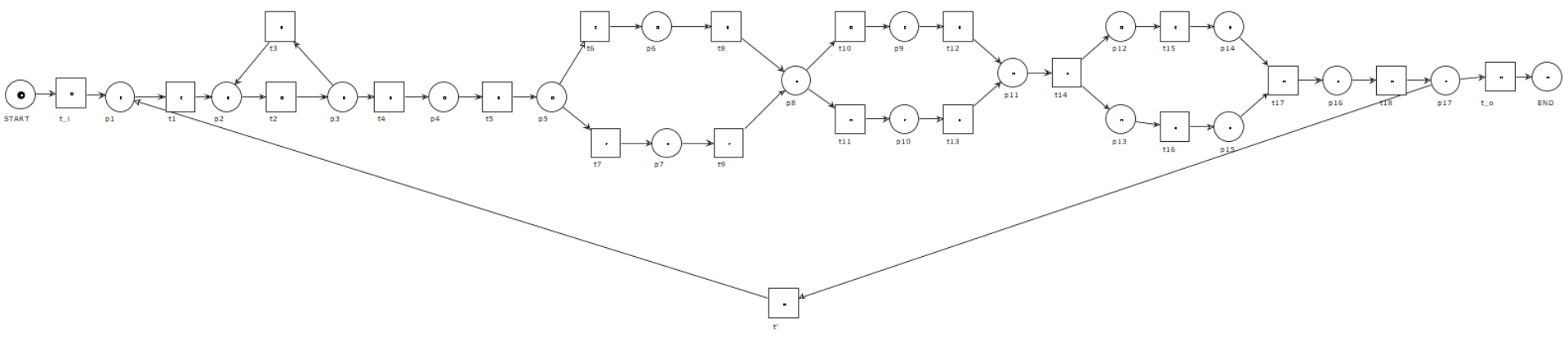
*** bounded**
Here both analyses also come to the same conclusion as there are no unbounded places.

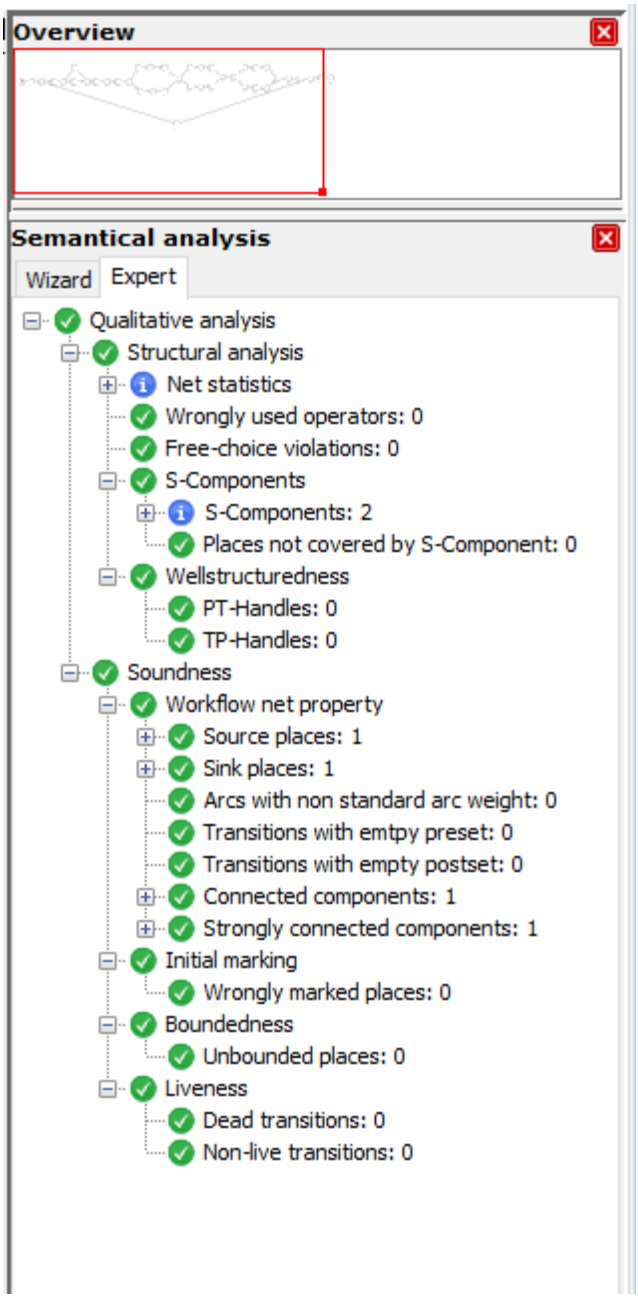
*** safe**
Here both analyses also come to the same conclusion as there are no unbounded places.

*** and live**
Here my analysis differ from the tool analysis as WoPeD suggests that the Petri net is live. In my understanding it cannot be life because it reaches in M16 (see assignment 2b) a state in which no transition is enabled, and thus the model cannot perform another instance.

Assignment 2

(d) Analysis via Tool Support – Part 2




Overview
Semantical analysis
Wizard
Expert
Qualitative analysis
Structural analysis
Net statistics
Wrongly used operators: 0
Free-choice violations: 0
S-Components
S-Components: 2
Places not covered by S-Component: 0
Wellstructuredness
PT-Handles: 0
TP-Handles: 0
Soundness
Workflow net property
Source places: 1
Sink places: 1
Arcs with non standard arc weight: 0
Transitions with emtpy preset: 0
Transitions with empty postset: 0
Connected components: 1
Strongly connected components: 1
Initial marking
Wrongly marked places: 0
Boundedness
Unbounded places: 0
Liveness
Dead transitions: 0
Non-live transitions: 0