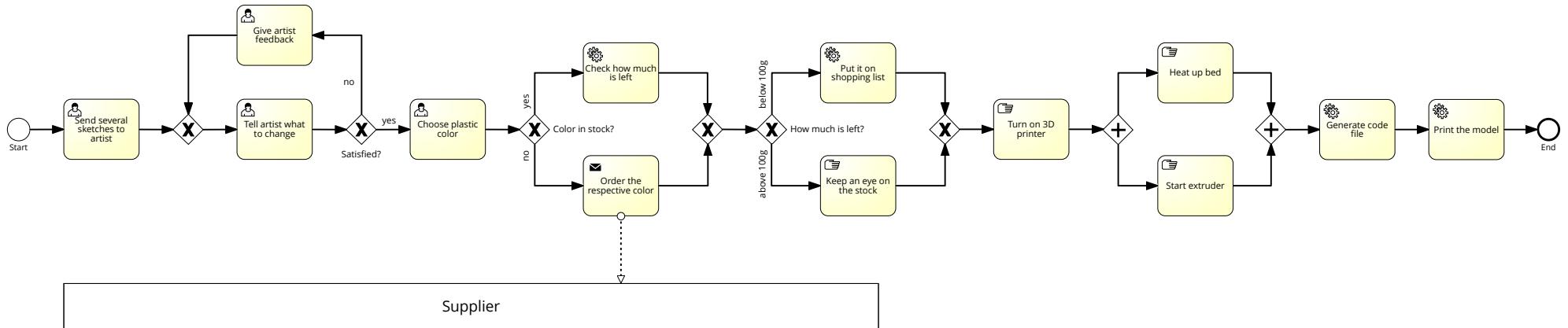
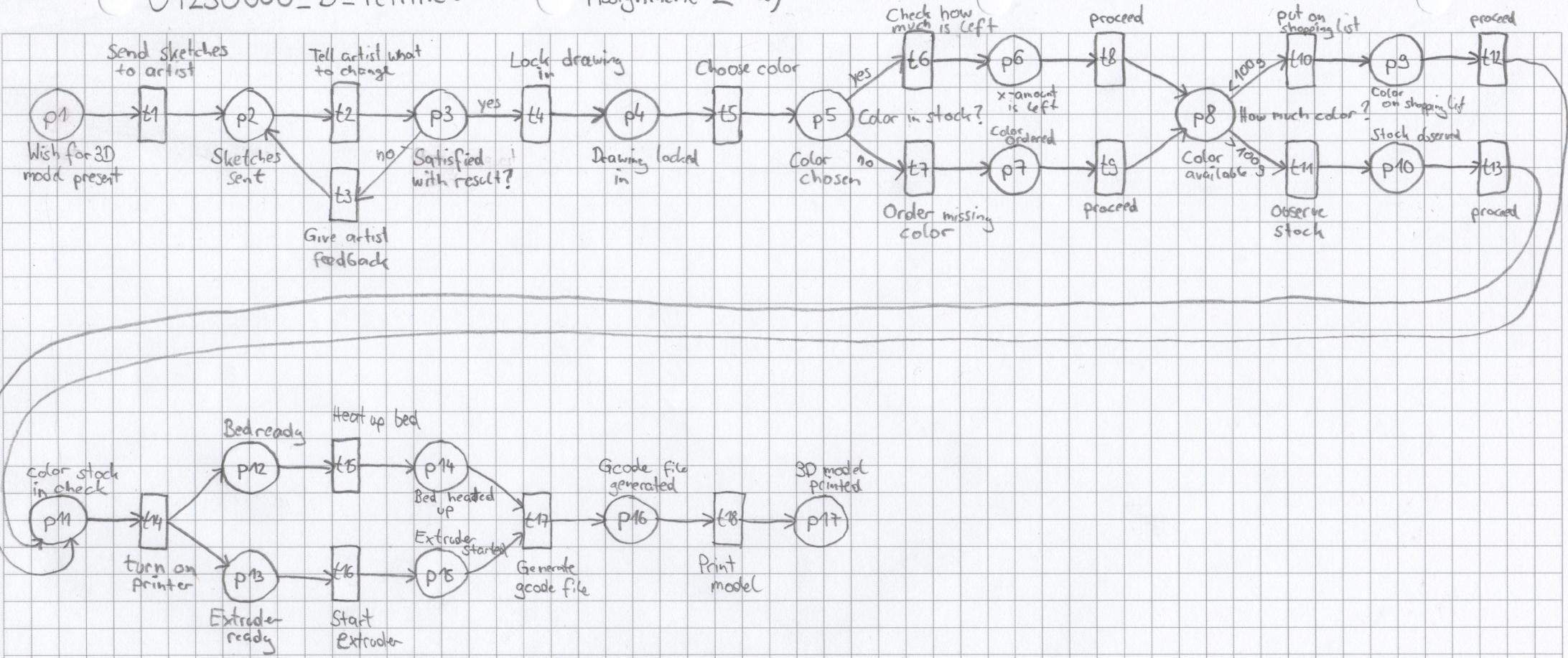


01250600_B_BPMN



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 naturally (if modeled correctly) sound. As it is mandatory to have a petri net that is structurally sound in assignment 2 d, I thought it would save me time and effort if I already consider this property at the very beginning. There was no need for weighted arcs or places that may hold more than 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				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 2b,

Marking	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	p11	p12	p13	p14	p15	p16	p17	Firing
M ₀	1																	$t_1 \rightarrow M_1$
M ₁		1																$t_2 \rightarrow M_2$
M ₂			1	1														$t_3 \rightarrow M_1, t_4 \rightarrow M_3$
M ₃				1	1													$t_5 \rightarrow M_4$
M ₄					1	1												$t_6 \rightarrow M_5, t_7 \rightarrow M_6$
M ₅						1	1											$t_8 \rightarrow M_7$
M ₆							1	1										$t_9 \rightarrow M_7$
M ₇								1	1									$t_{10} \rightarrow M_8, t_{11} \rightarrow M_9$
M ₈									1	1								$t_{12} \rightarrow M_{10}$
M ₉										1	1							$t_{13} \rightarrow M_{10}$
M ₁₀											1	1						$t_{14} \rightarrow M_{11}$
M ₁₁												1	1					$t_{15} \rightarrow M_{12}, t_{16} \rightarrow M_{13}$
M ₁₂													1	1				$t_{16} \rightarrow M_{14}$
M ₁₃														1	1			$t_{15} \rightarrow M_{14}$
M ₁₄															1	1		$t_{17} \rightarrow M_{15}$
M ₁₅																1		$t_{18} \rightarrow M_{16}$
M ₁₆																	1	$t' \rightarrow M_0$

Sound

bounded

safe

Live