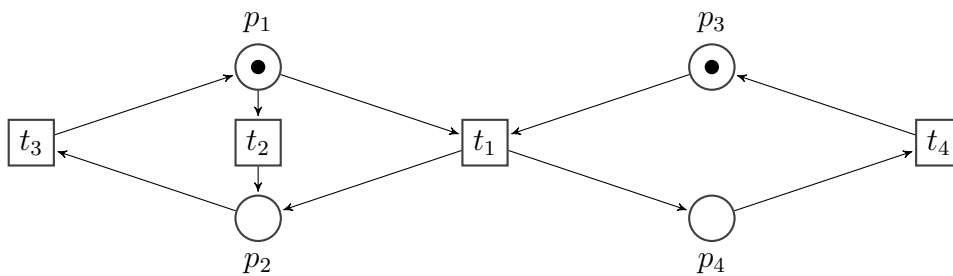For the first three problems you must unfold the given Petri nets to a finite and complete prefix using the ERV algorithm and McMillan's adequate order.

Also, you should give the sets of possible extensions and cut-offs at each iteration of the algorithm as well as argument why each event in the cut-off set is a cut-off.
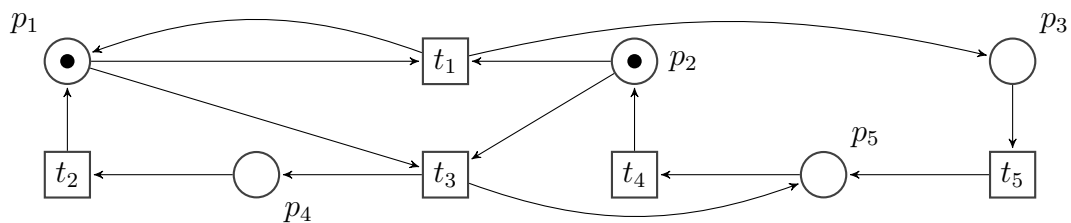
Problem 1: Unfolding Prefix
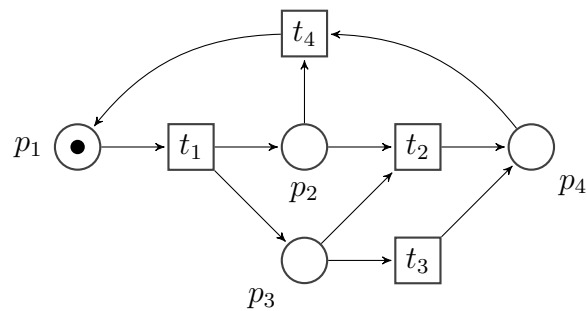

Problem 2: Unfolding Prefix
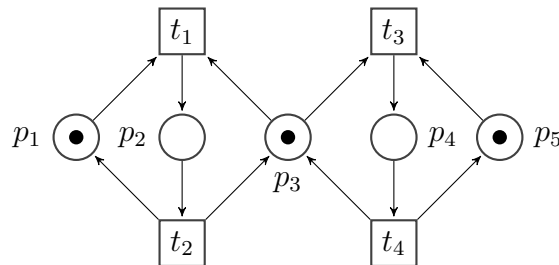
Problem 3: Unfolding Prefix

Problem 4: SAT-Based Verification

Consider the Petri net depicted below.

(a) Compute the finite complete prefix $(\mathcal{O}, h) = (B, E, G)$ of the Petri net's unfolding. Express the reachability of the marking $(0\ 0\ 0\ 1)^T$ as violation constraint $\mathcal{V}$.

(b) Find a general formula $\mathcal{M}$ characterizing reachability of a marking in a complete prefix starting from the $\mathcal{C} \wedge \mathcal{V}$ formula given in class. Use extra Boolean variables x_b for every $b \in B$.