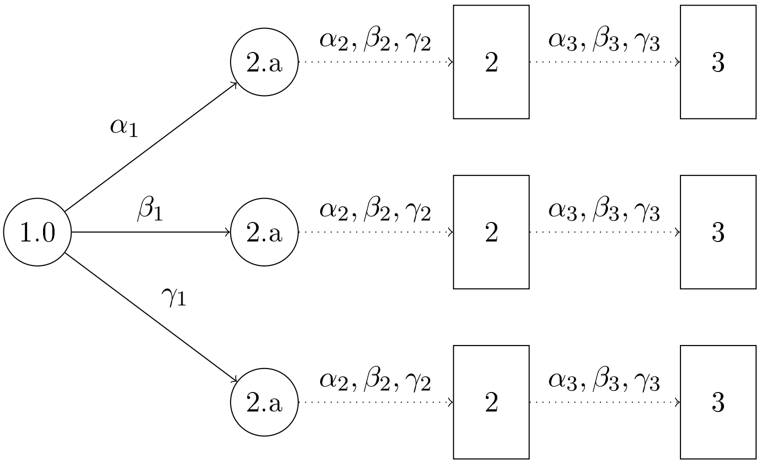
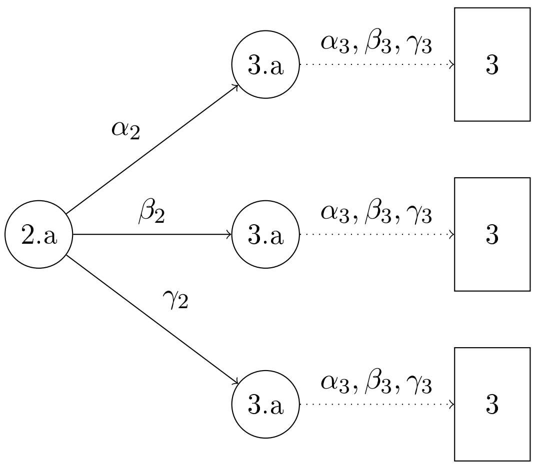
1. a) The decision maker prefers a lottery that gives the higher expected payoff in the worst possible state.
   b) Monotonicity is violated.
   c) Consider for example the following definition of $f \succcurlyeq_T g$: $\sum_{s \in T} \min\{x \mid f(x|s) > 0\} \geqslant \sum_{s \in T} \min\{x \mid g(x|s) > 0\}$. This would violate e.g. the strict subjective substitution axiom.

2. a) We write α_i, β_i, γ_i for the strategies of players $i = 1, 2, 3$. To clarify the presentation, we first draw the first level completely, but compress the subgames for player 2 and player 3.



In place of the boxes for player 2 in the above picture, the following subgame has to substituted:



The important thing in this substitution is that information states for players 2 (and 3) need to be copied, as player 2 (player 3) don't know the decisions of the other players. It is easy to see how to define the subgame that is substituted for the boxes for player 3 and the corresponding payoffs are computed: in case of an even vote, player 1 gets an additional decision node (e.g. marked 1.d) where she always choses option α, as this gives the best payoff for her.

b) The algorithm on page 48 in the book transforms the above extensive game Γ^e into its normal representation Γ. The reduced strategic form is (in principal) obtained by removing randomly redudant strategies, but this doesn't change Γ. We render below one row of the strategic form of Γ, where we fix the votes of player 1 and 2 to α.

	P_3		
P_1	α_3	β_3	γ_3
α_1	(8,0,4)	(8,0,4)	(8,0,4)

c) $\forall$ player i, $\forall$ nodes x y z controlled by i $\forall$ alternatives b at x

- if y and z have the same information state and if y follows x and b
- $\exists$ node w and some alternative c at w such that z follows w and c
- w is controlled by player i, w has the same information label as x and c the same move label as b

3. a) The game Γ_1 has three Nash equilibria:

$$([C],[S]) \quad ([S],[C]) \quad (\frac{1}{101}[C] + \frac{100}{101}[S], \frac{1}{101}[C] + \frac{100}{101}[S]) .$$

b) The only strongly dominated strategy in Γ_2 is Pp, but note that Pp is *not* randomly redudant. Hence the fully reduced normal presentation of Γ_2 equals Γ_2.

c) The game Γ_2 has a unique randomised Nash equilibrium:

$$(\frac{1}{3}[Rr] + \frac{2}{3}[Rp], \frac{2}{3}[M] + \frac{1}{3}[P]) .$$

4. Let $([k],[j])$ for $k \in M$, $j \in N$ denote a pure equilibrium. Now, if we start the LH algorithm in vertex $(\mathbf{0},\mathbf{0})$, we set the missing label to k. I.e., we traverse the unique edge that doesn't have label k. At the endpoint of this edge, we pick up a label that is the best response to strategy k, which is j by assumption. Morover, as $([k],[j])$ is an equilibrium, we know that k is also best response to j. I.e., if we drop j in the second polytope, we will pick up the best response to j, which happens to be k, the missing label.

5.

statement	**yes**	**no**
To assert a player is *intelligent*, means the player makes decisions consistently in pursuit of her own objective.	☐	✓
Let X be a finite set of decisions and Ω a finite set of states. For any decision $y \in X$ that is strongly dominated by a randomised strategy $\sigma \in \Delta(X)$ there exists a probability distribution $p \in \Delta(\Omega)$ such that y is an optimal decision.	☐	✓
A set of vectors S is convex if for any two vectors p, q also $\lambda p + (1 - \lambda) q \in S$, where $\lambda \in [0, 1]$.	✓	☐
A game with incomplete information is a game in extensive form such that no two nodes have the same information set.	☐	✓
Given a finite game Γ in strategic form, there exists at least one pure equilibrium.	☐	✓
In a Dutch auction the seller starts from a price of zero and continuously raises this price. The auction is over when the penultimate bidder leaves the auction and is won by the remaining bidder.	☐	✓
A game may have multiple equilibria, but at least one of the equlibria is efficient.	☐	✓
A two-person game is called nondegenerated if all randomised strategies σ whose support has cardinality k have at most k pure best responses.	✓	☐
For a Nash equilibrium (σ, ρ) of a nondegenerated two-person game, σ and ρ have support of equal size.	✓	☐
If we can show that $\mathsf{NASH} \in \mathsf{P}$, then $\mathsf{P} = \mathsf{NP}$ follows.	☐	✓