Definition

A *state transition system* (STS) consists of

- S is a set of *states* (observations);
- $S_0 \subseteq S$ is a set of *initial states*.
- $T \subseteq S \times S$ is a *transition relation*;

Definition

A *behavior* is a sequence $\alpha \in S^\omega$ s.t.:

- $\alpha_0 \in S_0$;
- $(\alpha_i, \alpha_{i+1}) \in T$ for $i = 0..$;

The verification problem(STS)

Given:

1. STS (S, S_0, T) with behaviors $\alpha \in B$;
2. state property $I \subseteq S$;

Prove:

$$\forall a \in B : \forall i \in \omega : a_i \in I.$$

Definition

A property I for which the above holds is called an invariant of the STS.