Definition 0.1. A **search problem** $\Pi := \langle \mathcal{S}, \mathcal{A}, \mathcal{T}, \mathcal{I}, \mathcal{G} \rangle$ consists of a set $\mathcal{S}$ of **states**, a set $\mathcal{A}$ of **actions**, and a **transition model** $\mathcal{T} : \mathcal{A} \times \mathcal{S} \to \mathcal{P}(\mathcal{S})$ that assigns to any action $a \in \mathcal{A}$ and state $s \in \mathcal{S}$ a set of **successor states**.

Certain states in $\mathcal{S}$ are designated as **goal states** (also called **terminal state**) ($\mathcal{G} \subseteq \mathcal{S}$) and **initial states** $\mathcal{I} \subseteq \mathcal{S}$.