A problem can be defined formally by four components

• Initial state that the agent starts in – e.g. In(Arad)

• A description of the possible actions available to the agent – Successor function – returns a set of pairs – e.g. {, , } – Initial state and the successor function define the state space ( a graph in which the nodes are states and the arcs between nodes are actions). A path in state space is a sequence of states connected by a sequence of actions

• Goal test determines whether a given state is a goal state – e.g.{In(Bucharest)}

• Path cost function that assigns a numeric cost to each path. The cost of a path can be described as the some of the costs of the individual actions along the path – step cost – e.g. Time to go Bucharest