

Assessment 1
Part 1

a) Propose a representation for the states of the environment and provide a specific example.

Answer:

< Kitchen Sensor, Bedroom Sensor, Bathroom Sensor, Cook Detector, Smoke Detector, Light Switches Controllers >

Where:

- KitchenSensor $\in \{ON, OFF\}$ – ON if someone is detected in the kitchen; else, it is OFF
- BedroomSensor $\in \{ON, OFF\}$ – ON if someone is detected in the Bedroom; else, it is OFF
- BathroomSensor $\in \{ON, OFF\}$ – ON if someone is detected in the Bathroom; else, it is OFF
- CookerDetector $\in \{ON, OFF\}$ – ON if cooker is being used, else, it is OFF.
- SmokeDetector $\in \{ON, OFF\}$ – ON if someone smoke is detected; else, it is OFF
- LightSwitchDetectorKitchen $\in \{ON, OFF\}$ – ON if light switches are opened; else, it is OFF.
- LightSwitchDetectorBedroom $\in \{ON, OFF\}$ – ON if light switches are opened; else, it is OFF.
- LightSwitchDetectorBathroom $\in \{ON, OFF\}$ – ON if light switches are opened; else, it is OFF.

b) Provide a representation for the actions of the agent.

- setKitchenSensorToOn, setKitchenSensorToOff
- setBathroomSensorToOn, setBathroomSensorToOff
- setBedroomSensorToOn, setBedroomSensorToOff
- setCookerDetectorToOn, setCookerDetectorToOff
- setLightSwitchDetectorKitchenOn, setLightSwitchKitchenOff
- setLightSwitchDectectorBedroomOn, setLightSwitchBedroomOff
- setLightSwitchDetectorBathroomOn, setLightSwitchBathroomOff
- setSmokeDecetorOn, setSmokeDecetorOff

- c) Provide a sample run with at least three states and three actions using your proposed representations of the previous items.



- d) Provide a definition of a state transformer function for three actions of your item b. Your software agent should turn the cooker off (or leave it as it is) and turn on/off the lights of the rooms depending on where are people. Notice that the environment is non-deterministic as people move about turning lights on / off as well as the cooker (over-riding whatever the agent does).

τ (PersonInKitchen, PersonNotInBedroom, PersonNotInBathroom, CookerON, NoSmoke, KitchenLightsON)

τ (PersonInBedroom, PersonNotInBathroom, PersonNotInKitchen, CookerOFF, NoSmoke, KitchenLightsOFF, BathroomLightsOFF, BedroomLightsON)

τ (PersonInBathroom, PersonNotInBedroom, PersonNotInKitchen, CookerOFF, NoSmoke, KitchenLightsOFF, BedroomLightsOFF, BathroomLightsON)

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