

**Assessment I**  
**CS551K – Software Agents and Multi-Agent Systems**  
**2020-2021**

Instructions to students:

- Your solution should be one single PDF file which you should upload onto MyAberdeen by the established time/deadline. Please do not email us your solution.
  - Your PDF file should be named “CS551K-ASMNT1-Day-X-YourSurname-YourName-YourIDNo”. For instance, “CS551K-ASMNT1-Day-1-Smith-John-999999.pdf”, where Day 1-5 should be the day of the class test in question, and 999999 is your student ID. Please try to make your submission file less than 10MB as you may have issues uploading large files onto MyAberdeen.
  - Indicate clearly in your submission which item each solution is for. If we cannot identify this, you may be marked down.
1. **(Intelligent Agents)** You are part of a team developing software agents to support people with disabilities living in sheltered accommodation. In a flat there are 3 sensors – one in the kitchen, one in the bedroom, and one in the bathroom – to indicate where people in the flat are. There is also a digital device to detect when the cooker is on/off and a smoke detector, and there are digital controllers to detect whether the light switches of all rooms are on or off. You should:
- a) Propose a generic representation for the states of the environment and provide a specific example. **(1 Mark)**
  - b) Propose a representation for the actions of the agents. **(1 Mark)**
  - c) Provide a sample run with at least three states and three actions using your proposed representations of the previous items. **(1.5 Marks)**
  - 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 there 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) **(1.5 Marks)**