Cleaning Robots - Exp 2

This code represents a multi-agent system (MAS) using AgentSpeak, specifically in the context of a cleaning robot scenario. The agents are programmed using belief-desire-intention (BDI) logic, where they follow plans to achieve goals based on the current state of the environment.

Story Summary

1. **Initialization and Goal:**
    - The robot (`r1`) is tasked with checking all slots for garbage using the goal `!check(slots)`.
2. **Decision-making Process:**
    - The robot evaluates conditions like the presence of garbage, battery charge level, and vacuum bag capacity.
    - Based on these conditions, different slots (`Slot R1-1`, `Slot R1-2`, or `Slot R1-3`) are printed to indicate the robot's progress or obstacles.

	Battery Power	Vacuum Bag	Dirt Intensity	Action
	min	min	min	burnGarb(50,1)
	min	min	mid	burnGarb(70,1)
	min	min	max	burnGarb(90,1)
	min	mid	min	burnGarb(50,1)
	min	mid	mid	burnGarb(70,1)
	min	mid	max	burnGarb(90,1)
	min	max	min	burnGarb(50,1)
	min	max	mid	burnGarb(70,1)
	min	max	max	burnGarb(90,1)
	mid	min	min	burnGarb(50,1)
	mid	min	mid	burnGarb(70,1)
	mid	min	max	burnGarb(90,1)
	mid	mid	min	burnGarb(50,1)
	mid	mid	mid	burnGarb(70,1)
	mid	mid	max	burnGarb(90,1)
	mid	max	min	burnGarb(50,1)
	mid	max	mid	burnGarb(70,1)
	mid	max	max	burnGarb(90,1)
	max	min	min	burnGarb(50,1)
	max	min	mid	burnGarb(70,1)
	max	min	max	burnGarb(90,1)
	max	mid	min	burnGarb(50,1)
	max	mid	mid	burnGarb(100,1)
	max	mid	max	burnGarb(100,1)
	max	max	min	burnGarb(70,1)
	max	max	mid	burnGarb(100,1)
	max	max	max	burnGarb(100,1)

3. **Collaboration:**

    - Robots communicate using messages (`.send`) to inform others about their status, such as continuing operations or reporting a problem.

      A Message pattern is `.send(agentName,tell, belief(anyvalue)).`

      A Message pattern is `.send(agentName,achieve, belief(anyvalue)).`

4. **Adjusting Behavior:**

    - If garbage is detected, the robot assesses if its battery is depleted or its vacuum bag is full.

    - It dynamically arranges vacuum power based on battery level, bag capacity, and dirt intensity using a series of detailed plans(`!arrangeVacuumPower`).

    - Each rule optimizes the energy spent on cleaning by adjusting the power level (e.g., `burnGarb(50,1)`).

5. **Adaptive and Fault-tolerant System:**

    - If `r1` cannot proceed, it signals for further support from other robot `r3` by sending `continue(r1,true), as a belief, remember the messaging pattern above. Also if we can check if a belief is received by another agent`
      `continue(AgentName,true)[source(AgentName)]`
    - The agents continuously monitor their state and adapt their actions to ensure efficient cleaning.