

# ARTIFICIAL INTELLIGENCE HOMEWORK2

## Submitted by

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## IMPLEMENTATION OF A MULTIAGENT SYSTEM

Language: python

Dependency: spade 3.2.2

Run command: python3 run main.py

### Description of Task

The SE4GD Cohort 1 students need to appoint a student representative to represent the student in board meetings and to be the voice of the students.

The students can vote on who becomes the student representative and this election process will be coordinated by the Student coordinator Letizia.

There are 3 students who have been nominated for the role, the person with the highest vote becomes the student representative.

I implemented a multi agent system for students in a class to elect their class representative. So in this systems, there are three types of agents, student agent, studentcoordinator agent, voting agent.

### The Multiagent System (Agents and Behaviours):

The student agents are first created, then the coordinator agent, then the voting agent

### CoordinatorAgent

This is the student coordinator, that informs the students that they have to appoint a student representative.

```
Hello! I'm Letizia Giorgietta , the Student Cordinator for the SE4GD Cohort 1
Student Cordinator speaks:

Message received with content:
  We shall be appointing : Our next student representative

Meeting begins with PRELIM at  2022-01-11 06:50:29.891858

We shall all vote for the student representative of choice in order of preference.
```

Coordinator agent giving information

### Coordinator Agent Behaviour - OneShotBehaviour

One shot behaviour implies that the coordinator agent will perform the task just once and finish. The student coordinator introduces herself and start the discussion on what the voting entails. The Coordinator agent is the informer in this case.

```
Last login: Sat Jan  8 18:32:18 on ttys000
(base) tomi@Esthers-MacBook-Pro ~ % cd multiagentvoting
(base) tomi@Esthers-MacBook-Pro multiagentvoting % python3 main.py
Enter number of students in the class: 5

Hi! I'm ST001, an SE4GD student

Hi! I'm ST002, an SE4GD student

Hi! I'm ST003, an SE4GD student

Hi! I'm ST004, an SE4GD student

Hi! I'm ST005, an SE4GD student
```

The student agents are created and they introduce themselves

## StudentAgent

User can define the number of student agent that will be involved in the voting, on running the program, the system asks user for the number of student agents to be created.

## Student Agent Behaviour - OneShotBehaviour

OneShot behaviour means the student agent performs the task once and finish.

The student agents introduce themselves when created. They then receive the message from the Coordinator agent, so the student agent is the receiver in this case.

## VotingAgent

The voting agent is responsible for transitioning between the prelim state, voting state and voting end states. This is the agent that handles the voting process and announces the winner at the end

```
Shrawan Bishowkarma
(ST002) : My choice candidates in order of preference are:
Mohammed Rijal
Haben Abraham
Shrawan Bishowkarma
(ST003) : My choice candidates in order of preference are:
Shrawan Bishowkarma
Mohammed Rijal
Haben Abraham
(ST004) : My choice candidates in order of preference are:
Haben Abraham
Mohammed Rijal
Shrawan Bishowkarma
(ST005) : My choice candidates in order of preference are:
```

Voting state

```
All students have voted.
Voting is over.
Winner of the first round is: Mohammed Rijal with 2 votes
The second round of voting includes Mohammed Rijal and Haben Abraham
The Winner is: Mohammed Rijal with 3 votes
Meeting ends with END at 2022-01-11 06:50:32.909092
```

Vote ended, winner announced

## Voting Agent Behaviour - fsmBehaviour

The agent behaviour is the FSM behaviour which has registered states and transitions between states. This behaviour was used because a transition needs to be made between the voting prelim state, to the main voting phase and the to the vote end phase.

**States**

Discussion state: introductory discussion

Voting state: where the agent give their votes

End state: when the voting ends and the result is being collated and winner is announced

**References**

<https://spade-mas.readthedocs.io/en/latest/agents.html>