Summary Post

by Anastasia Rizzo - Monday, 26 June 2023, 4:48 PM

In my summary post, I aim to provide a straightforward example that demonstrates how intelligent agents, using different communication languages, can effectively communicate and collaborate. Communication languages such as KQML, FIPA-ACL, and AgentSpeak offer agents specific rules and structures to exchange messages, carry out tasks, and coordinate their actions. In contrast, in Python, agents can directly communicate by invoking functions or methods. Let's consider a scenario where two agents, Alice and Bob, need to share information and synchronise their actions in order to illustrate these concepts.

KQML Example:

```
(send

  :receiver Alice

  :content (inform :sender Bob :message "Hello, Alice!"))
```

In this example, Bob sends a message to Alice. The message is an "inform" message with the content "Hello, Alice!". The message is addressed to Alice, and Bob is identified as the sender (Vidal, 2009).

FIPA-ACL Example:

```
ACLMessage message = new ACLMessage(ACLMessage.INFORM);

message.addReceiver(new AID("Alice", AID.IS LOCAL NAME));

message.setContent("Hello, Alice!");

send(message);
```

In this example, Bob sends an ACL (Agent Communication Language) message to Alice. The ACL message is of type "inform" and contains the content "Hello, Alice!". The message is addressed to Alice using her local name (fipa.org, 2002).

AgentSpeak Example:

```
+!message("Alice", content("Hello, Alice!")) <- .send("Bob",
inform, sender("Alice"), content("Hello, Alice!")).
```

In this example, an AgentSpeak agent, Bob, receives a message from Alice. The agent has a rule that matches when it receives a message from Alice with the content "Hello, Alice!". The agent then performs an action to send a message to another agent named "Bob" with an "inform" performative, specifying Alice as the sender and the content as "Hello, Alice!" (Vo & Ghose, 2004).

Python Example (Method Invocation):

```
class Agent:

    def __init__(self, name):

        self.name = name

    def send_message(self, receiver, message):

        print(f"Message sent from {self.name} to {receiver}:
{message}")

alice = Agent("Alice")

bob = Agent("Bob")

alice.send_message(bob.name, "Hello, Bob!")
```

In this Python example, the Agent class is defined with a method called "send_message". Each agent, Alice and Bob, is an instance of the Agent class. Alice invokes the "send_message" method and passes Bob as the receiver and the message "Hello, Bob!" as the content. The method implementation prints a message indicating that a message is sent from Alice to Bob with the specified content.

These examples showcase the practical implementation of communication in different languages and provide a clear comparison between agent communication languages and method invocation in Python.

References:

fipa.org, (2002). FIPA ACL Message Structure Specification. Available from: http://www.fipa.org/specs/fipa00061/SC00061G.html [Accessed 26 June 2023].

Vidal, J.M., (2009). KQML Example. Available from: https://jmvidal.cse.sc.edu/talks/agentcommunication/kqmlex.html [Accessed 26 June 2023].

Vo, D., & Ghose, A. (2004). Agent Programming Language within Complete Knowledge - AgentSpeak(I). In Proceedings of the Sixth International Conference on Enterprise Information Systems (pp. 356-363).