

Agent-Based Systems Tutorial 4

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- Q1** Design a solution for the vacuum-world example following Brooks' subsumption architecture. Identify how the design needs to change to allow an additional action to charge the robot at the home location whenever it runs low on power. Discuss how this design compares with the design based on deductive reasoning.
- Q2** Consider an InteRRaP-based design for a multiagent system composed for building a house, consisting of a builder, an architect, and a house owner agent. Describe informally how you would design the layers of each agent and discuss the issues that arise in the process with particular emphasis on the issue of balancing deliberative and reactive behaviour.
- Q3** Give an informal definition of the semantics of the following speech acts in terms of the capabilities and mental states of the participating agents:
- *reject*(A, B, φ): A indicates to B that it does not accept that φ is a valid statement
 - *refuse*(A, B, α): A indicates to B that it is not going to perform action α

Distinguish between two different cases: (i) if the two messages are supposed to be used as responses to some request, and (ii) if they can be "standalone" statements.

- Q4** Consider the FIPA protocol diagram for the Brokering Protocol given below and answer the following questions:
1. Explain its purpose and describe what the admissible message sequences look like that it generates.
 2. Describe any problems that could arise during execution of this protocol.
 3. Discuss the relationship between such a protocol and the process of (planning-based) means-ends reasoning in agent architectures.

