

WAS Assignment 5

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1 Question 1

I believe that the plan would fail, if another agent would move block B while A and C are being unstacked. From the output of the Jacomo console, we can see at which points the blocks are perceived by the agent. Before starting the organising task, the coordinates of all blocks is perceived. However, only the location of certain blocks are perceived during the execution of the task.

The output indicates that the updated location of block C is perceived again, before the gripper releases the block. After the block has been released, the gripper moves to the coordinates of B that have been perceived prior to the start of the execution of the organising task. If the location of block B would have been changed in the meantime, the gripper would move to an empty spot. In this case, the *pickUp* plan would fail, since it is a prerequisite that the block that needs to be picked up is present in this location. However, the entire plan would be restarted and the updated position of block B could be retrieved. Therefore, the plan would actually be successfully performed on the second run, given that no other agent intervenes with the blocks during execution.

I can see two approaches on how we could circumvent this behaviour:

- **Option 1** In case that the gripper arrives at the empty position, the perception task could be triggered again to find the updated coordinates of block B. This would also hold, if another block would be placed at the position since the gripper would not pick up the block if it is not the one block that it intends to pick up. I would describe this as some sort of *single-minded commitment* since the agent would then be committed to the intention of picking up block B no matter where it is located.
- **Option 2** Another possibility would be to perceive the locations of all blocks before and/or after each operation. This would lead to a better synchronisation between the agents beliefs and the state of the world. However, this would also imply many more computational operations to be performed. I would describe this as some sort of *open-minded commitment*.

In the end it is a bit of a trade-off, which option is more suitable for this task. If many agents operate in the same environment, option 2 might be better suited.

2 Question 2

In this case, I believe that the plan would fail again because the updated location of block B is only perceived when the block B is placed on C. While the gripper is picking up block A, the state of the world might have been changed and the beliefs of the agent could be out of sync. The *stack* plan would fail in this case, since the prerequisite of the object belonging to variable *Block2* is not at the desired location (X, Y, Z).

This issue could again be circumvented by using a synchronization mechanism as described in option 2 of task 1. Another possibility would be some sort of exception handler, similar to option 1 of task 1. However, the handler would need to address the issue that the block (on which the other block should be placed on) has moved.

3 Question 3

I would argue, that the agent, as it is configured at the moment, is mostly proactive but not reactive. The issues described in question 1 and question 2 are mainly due to some sort of blind commitment to the plan. Even though some blocks are perceived again here and there, the agent has just recently moved the block to another position. Therefore, this cannot really be described as reactive behaviour. However, if we implemented some of the measures as described in option 1 & 2 of question 1, we could make sure that the agent is also reactive to environmental changes.