Programming experience questionnaire participant number:

How would you grade your programming knowledge in C or C++:
(0 = no experience, 6 = professional (for money) programmer)

0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □

How would you grade your programming knowledge in programming Arduino:
(0 = no experience, 6 = professional (for money) programmer)

0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □

How would you grade your programming knowledge in programming LEGO Mindstorms:
(0 = no experience, 6 = professional (for money) programmer)

0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □

Please give a ranking of all the programming languages and how much experience you have in each. (0 = no experience, 6 = professional (for money) programmer)

1. _____ 0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □
2. _____ 0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □
3. _____ 0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □
4. _____ 0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □
5. _____ 0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □
6. _____ 0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □

Post experiment questionnaire participant number:

Thank you for participating in our experiment!
This really helps us in doing research about learning behavior in product development.

This experiment is anonymous but before you leave, we would like to know some things from you:

Specify your gender:

Which year were you born:

What is your study program:

Which semester are you in in your current field of study:

How pleased are you with the result of your programming?
(0 = not at all, 6 = very pleased)

0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □

How much did you enjoy this experiment? (0 = not at all, 6 = it was very pleasurable)

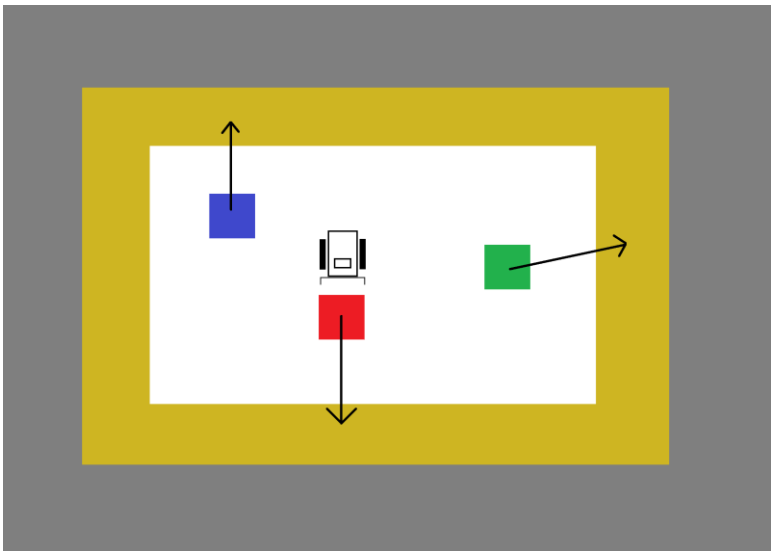
0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □

Do you have a study colleague in mind that you will recommend to participate in this experiment? Yes □ No □

Will you actually recommend it to him or her? Yes □ No □

One final (but very important) remark:
Please do not tell anyone about the content of this experiment.

The task is to use the robot to remove the three cube objects from the white area in the shortest time possible.



The robot must stay on the cardboard area.
You may use any of the three blinking light sources and place them wherever you like before executing the program. They fit into the top side of the cube objects. The robot shall not be influenced by you after the program is started.

Objects that are fully outside the white area on the cardboard must be removed from the "playground" by you.

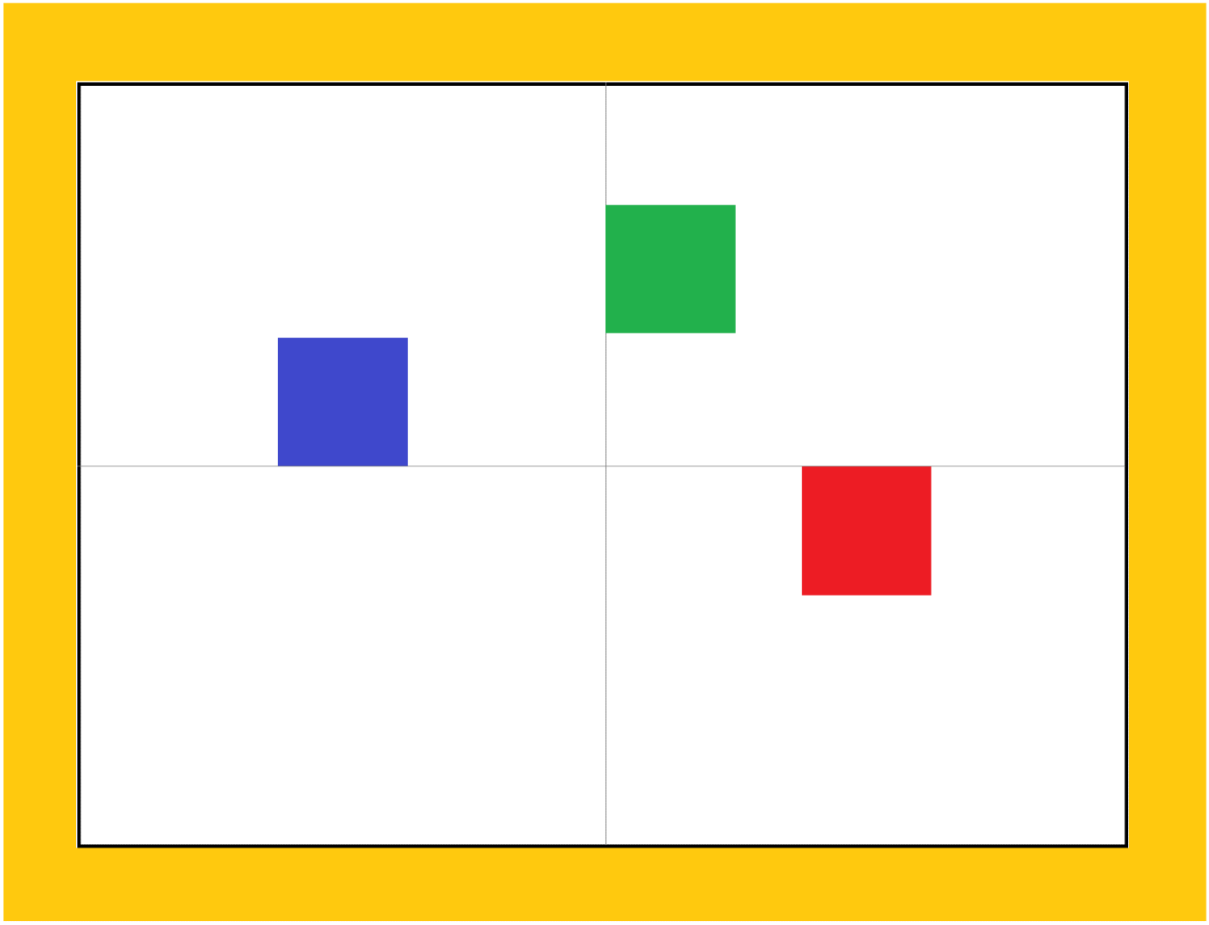
You can earn a 10 second time bonus if you display the correct tone frequency while pushing out a cube. You will get a 10 second time penalty if you play the wrong tone frequency.

Red cube: 400 Hz
Green cube: 800 Hz
Blue cube: 1600 Hz

You are given:

- The LEGO robot
- This task description with the starting setup (backside)
- Explanation of useful functions
- A data sheet about the robot's behaviour
- Time to complete the task
- Three blinking light sources

This is the setup of the cube objects for each evaluation. The starting position and orientation of the robot will be different each time.



Participant number:

What are the <u>essentials</u> the robot somehow needs to solve to not fail the task?

Write them down as keywords on this paper.

Think about <u>which</u> problems to solve not how to solve it.

1. _____
2. _____
3. _____
4. _____
5. _____

6. ____

Participant number:

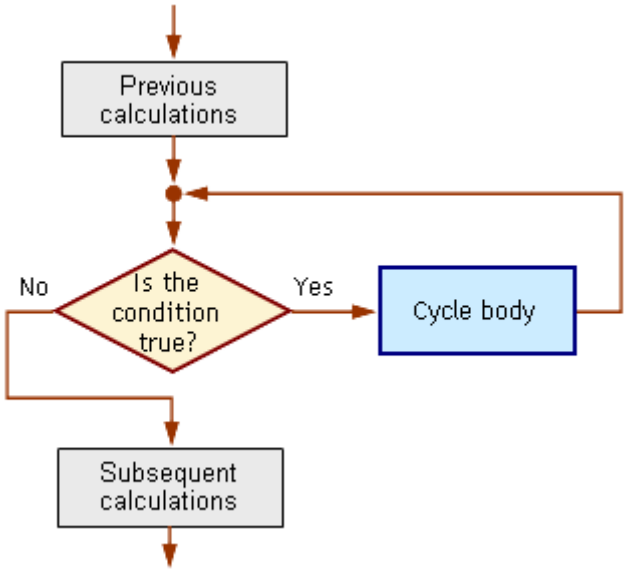
Make a plan!

Think about how you the robot shall solve the task.

Draw a block diagram on the backside.

Your plan in words:

Example of a block diagram:



Your block diagram: