



## Project name: Parking robot

Countries:	Czech Republic	Hungary
Suitable for grade:	3-4	3-4
Specialization:	IT, Automatic systems	IT
Responsible teacher:	Pavel Urban	Tamás Kósa

### Project description:

A Robocar kit with ARDUINO must be programmed for parking in the designated place. The model of the car parking and the car will be made by the Hungarian partner.

The robot car steps up to the entrance of the car park with manual management. The microcomputer drives the car into the car park changing to automatic management then it searches the first free parking place. If it finds it, it makes the car parked. After little waiting, manually, the controller turns the car off the car park and directs to the exit, where it stops and hands over the control to the manual control.

### Project tasks:

Student #1 (CZ):

- To build a provisionalsystem
- To programme ARDUINO
- To build a finalcar
- To write the documentation both in English and Czech language

Student #2 (H):

- To Make the final model parking place
- To Assemble sensor and actuator
- To programme HW tests on ARDUINO
- To write documentation in both English and Hungarian language

### Implementation of the project:

We suggest two formats for execution.

Both are based on a parking lot, enclosed park yard which is surrounded by a parapet wall, it is one-way, and it has at least 10-12 parking places. The difference comes from the different versions: what kind of parking technique it is necessary to use.

The project can be implemented with or without additional accessories.

For extra additions, we make the following suggestions:

- automatic barrier at the entrance and the exit
- parking-counter and display at the entrance.

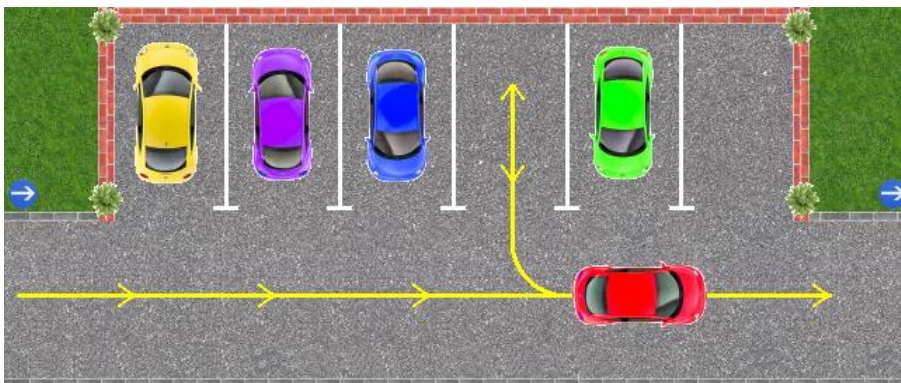
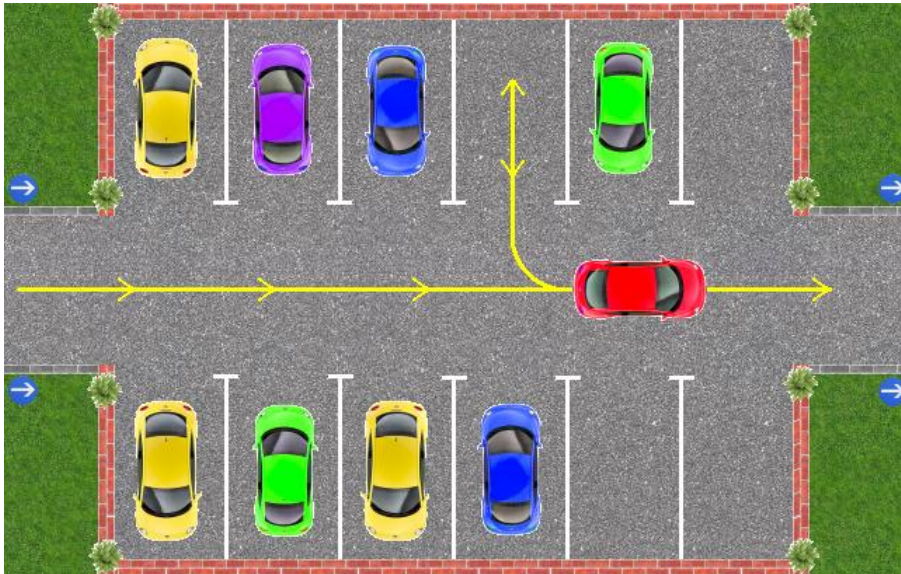


**Construction proposal:**

**1. Parking in a perpendicular reverse direction**

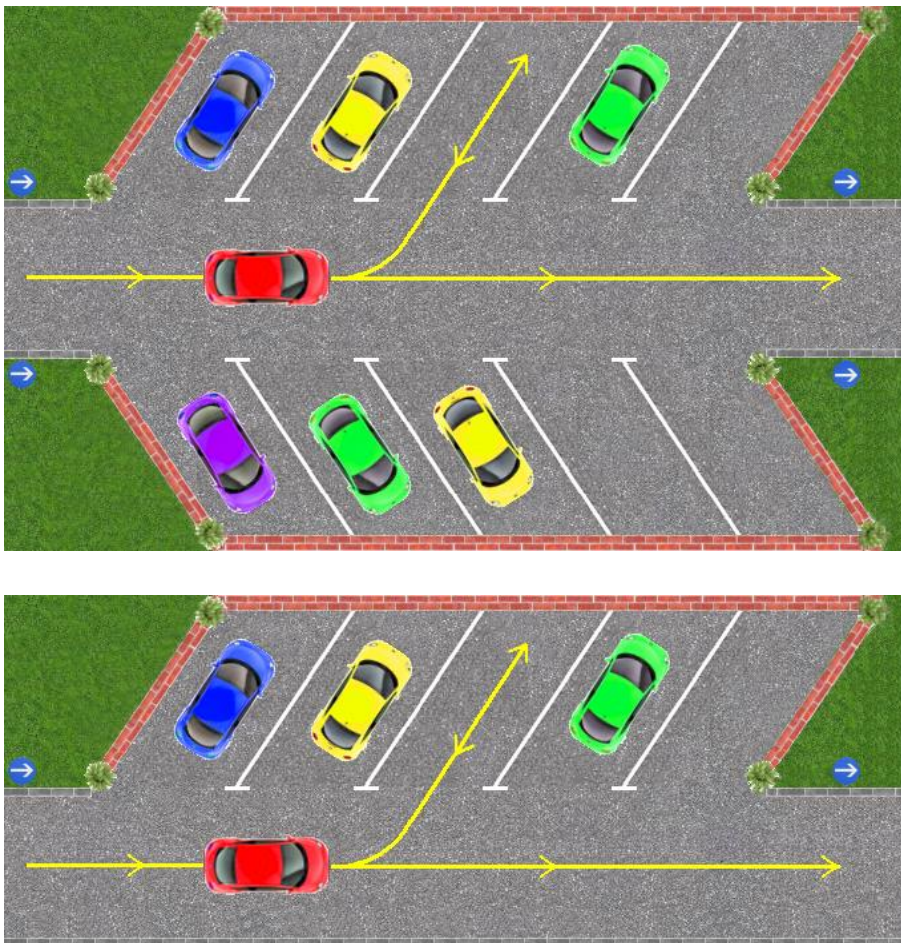
The construction of it is possible in one- or two-side parking forms.

The car searches the first free park place, passes it and parks in reverse. The car leaves the parking place and the park yard in forward direction.



## 2. Forward parking with lopsided direction

Its form can be carried out with one-side or two-side parking lots. The car searches the first free parking place and parks in forward direction. The car drives out in reverse and then it drives out forward from the car park.



### Extra supplements:

The car park can be carried out according to the claim. It can be perpendicular on one-side, and lopsided on the other side with parking places. And it can be equipped with the following extras:

- automatic barrier
- parking-counter and displayer.

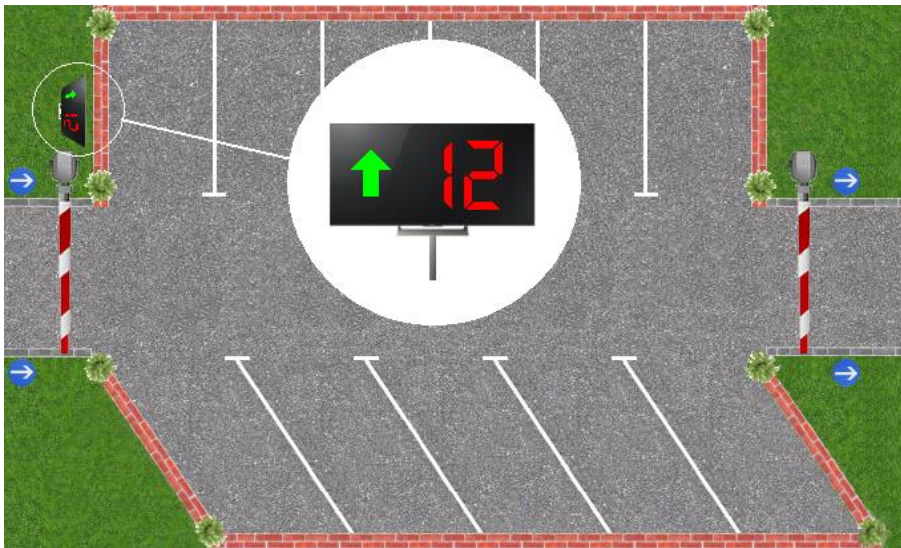
Both additions are independent from the robot car; it claims the forming of a control, which can be handled as the part of the parking lot.

### 1. Automatic barrier

It can be placed at the entrance and the exit of the parking lot. Its operation is automatic, the arriving of the car is detected by a sensor and to the sign of it, and the controller raises the pike.

## 2. Parking place counter

A display can be placed at the entrance of the parking lot, which displays the number of the free parking places. If there is any free place in the car park, the barrier will be raised. If there is no free place, the barrier will not open. The number of the free parking places reduces by 1 when a car parks in; and increases by 1 when the car parks out. Sensors are needed to the implementation at the entrance and the exit.



### Success criteria:

The car parks automatically in the free parking space.

### Developed hard skills:

Analysis of real problems, usage of different sources of information, programming in C language, software configuration, improvements in English language, equipment selection, trouble shooting, complex problem solving

### Developed soft skills:

Communication skills, problem solving skills, creativity, team work capability