**EXERCISE WORK 1**

Group 11

Jan Librowski (student number )

Pavel Talchikov (student number 0549367)

# Introduction

The aim of the work is to create a state machine model of car using Arduino kit with all kinds of details except motion sensor and the keypad module.

# IMPLEMENTATION

## Planning

It was decided to use Arduino MEGA instead of UNO because it has more pins for connection. The plan is to require minimum criteria and to add an extra feature – headlight turns on when the car starts working and stop signal turns on when the car brakes. Moreover, emergency lights can also be turned on.

Our work requires the following elements(except Arduino MEGA and breadboard with wires):

* LCD display

Is used for displaying information for the user

* Motor

Is used for indicating the speed of the car movement

* L293D

Is used for controlling the motor

* Potentiometer (10 kΩ)

Is used for the correct work of LCD display

* 5 × button(small)

Are used for controlling the car: turning on/off, accelerating, changing the direction of driving, braking and turning on/off emergency lights

* 2 × LED (white and red)

White LED is used as a headlight, red is used as a stop signal

* 8 × 220 kΩ resistor

Are used for the correct work of buttons and LED lights

* 1 × 10 kΩ resistor

Is used for the correct work of LCD display

In addition, a power supply module can be used to provide the breadboard with power.

## Assembling the circuit

At this step the circuit was assembled and tested with a simple program checking correct input/output. Figure 1 illustrates the circuit schema completed in Fritzing program.

If a power supply module is used, it can be installed on the left side of the breadboard. This way, two orange wires which supply breadboard with power from Arduino can be removed.

Изображение выглядит как цепь, электроника

Автоматически созданное описание

Figure 1. The schema of the circuit

Completed circuit was tested, all flaws were corrected, and the implementation of the following step started.

## Programming

# Conclusions

The aim of the work is done – the circuit and program work as planned and user can experience a car simulation state machine.