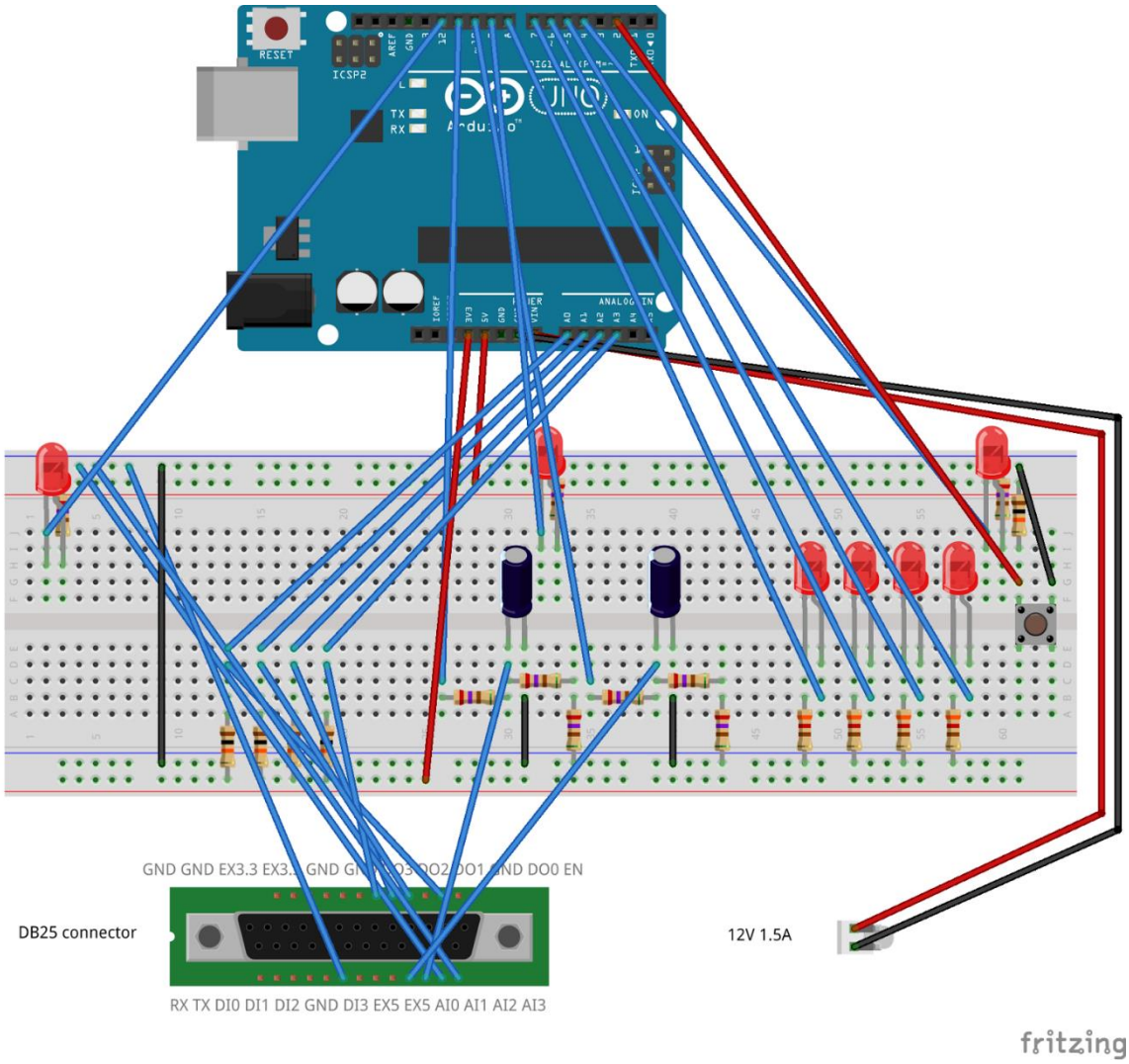
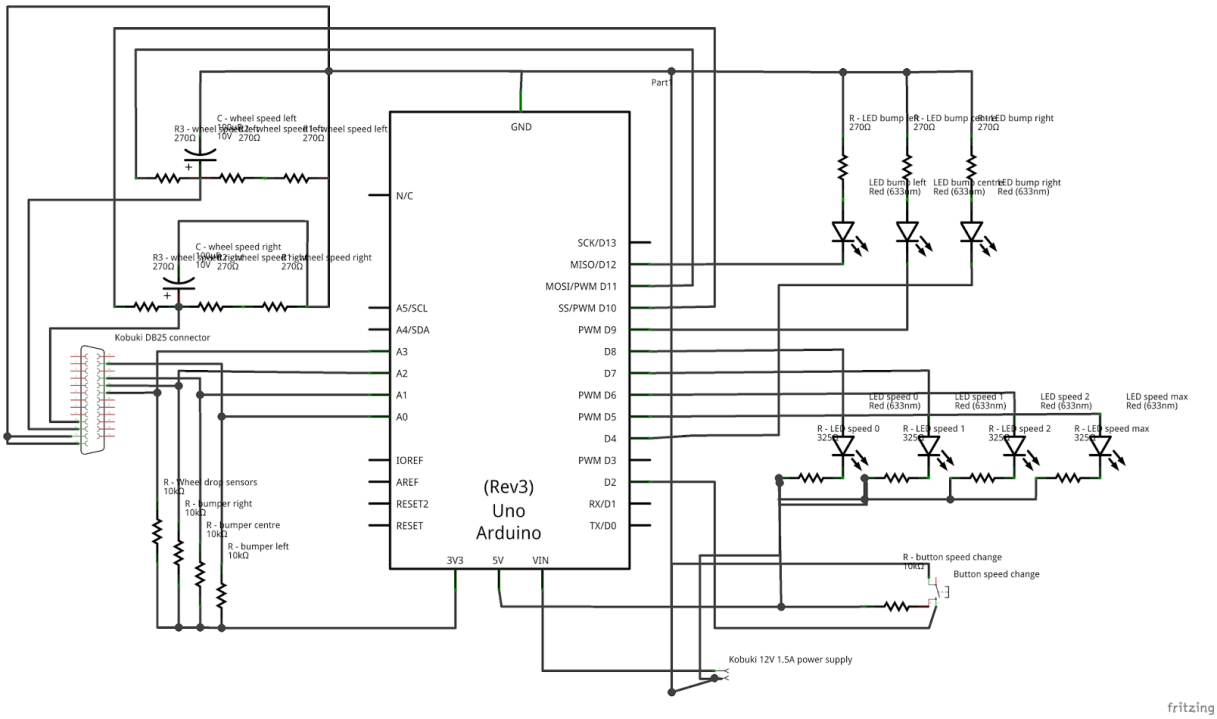
Hardware

Move the robot :



To start the robot, don’t forget press B1 during 2 sec just after the power on of the robot. Then press one time B0.

The second led on the breadboard must be light



Cables of the serial port are :

(pin15) Do0 -> White wire

(pin17)Do1 -> Purple wire

(pin18)Do2 -> (Firmness) soft green wire

(pin19)D03->(firmness) soft yellow wire

(pin13)AI3->hard yellow wire

(pin12)AI2->hard green wire

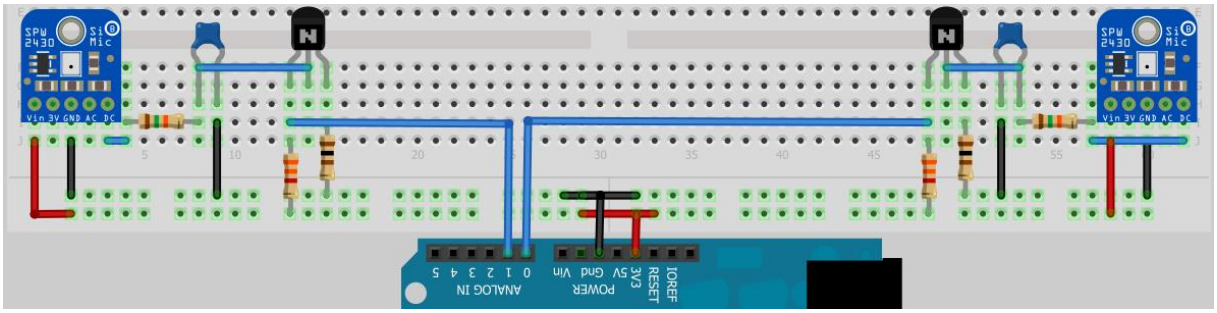
(pin11)AI1->blue wire

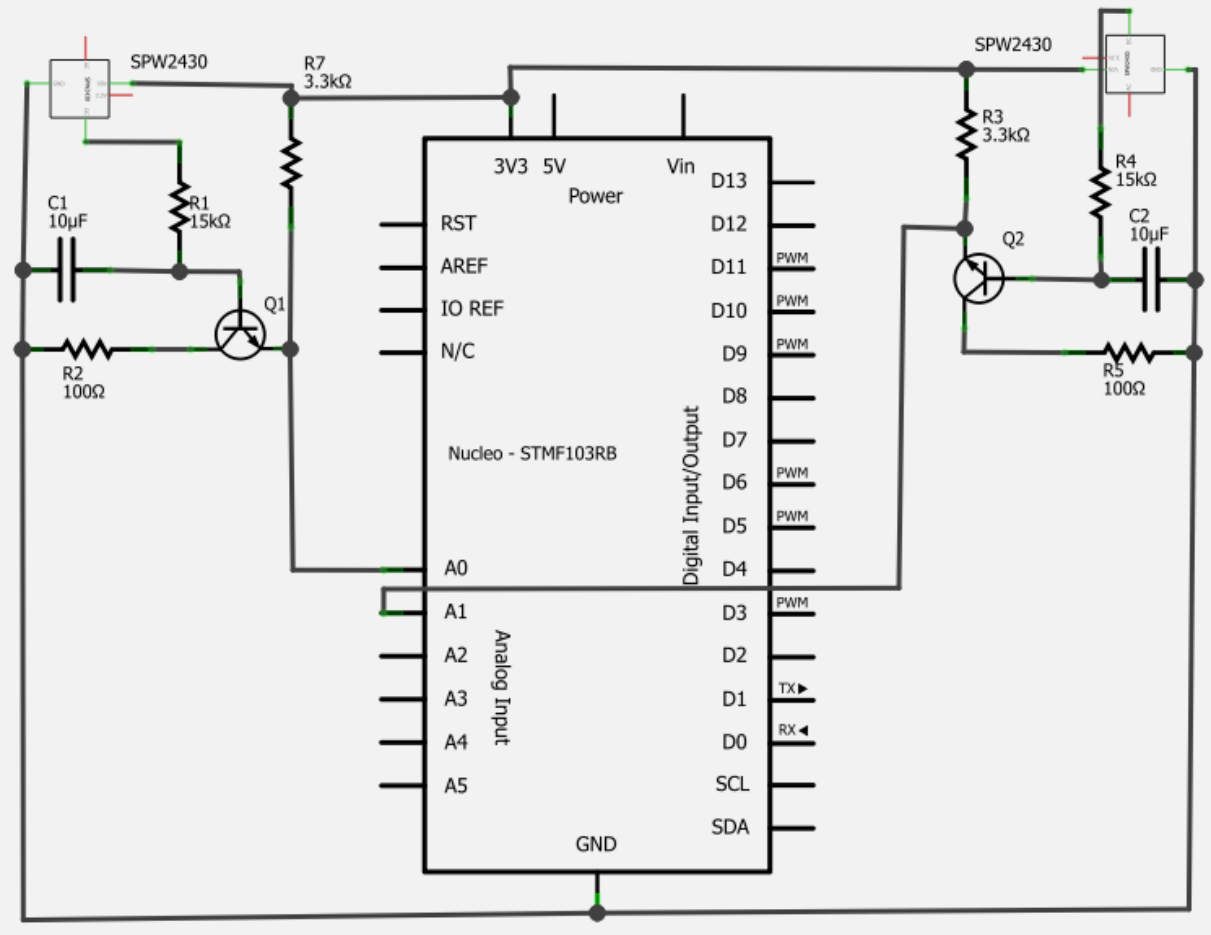
(pin10)AI0->(firmness) soft yellow wire with black on the top

(pin9, 5V)EX5-> Red wire (only if needed)

(pin6)GND-> hard green wire

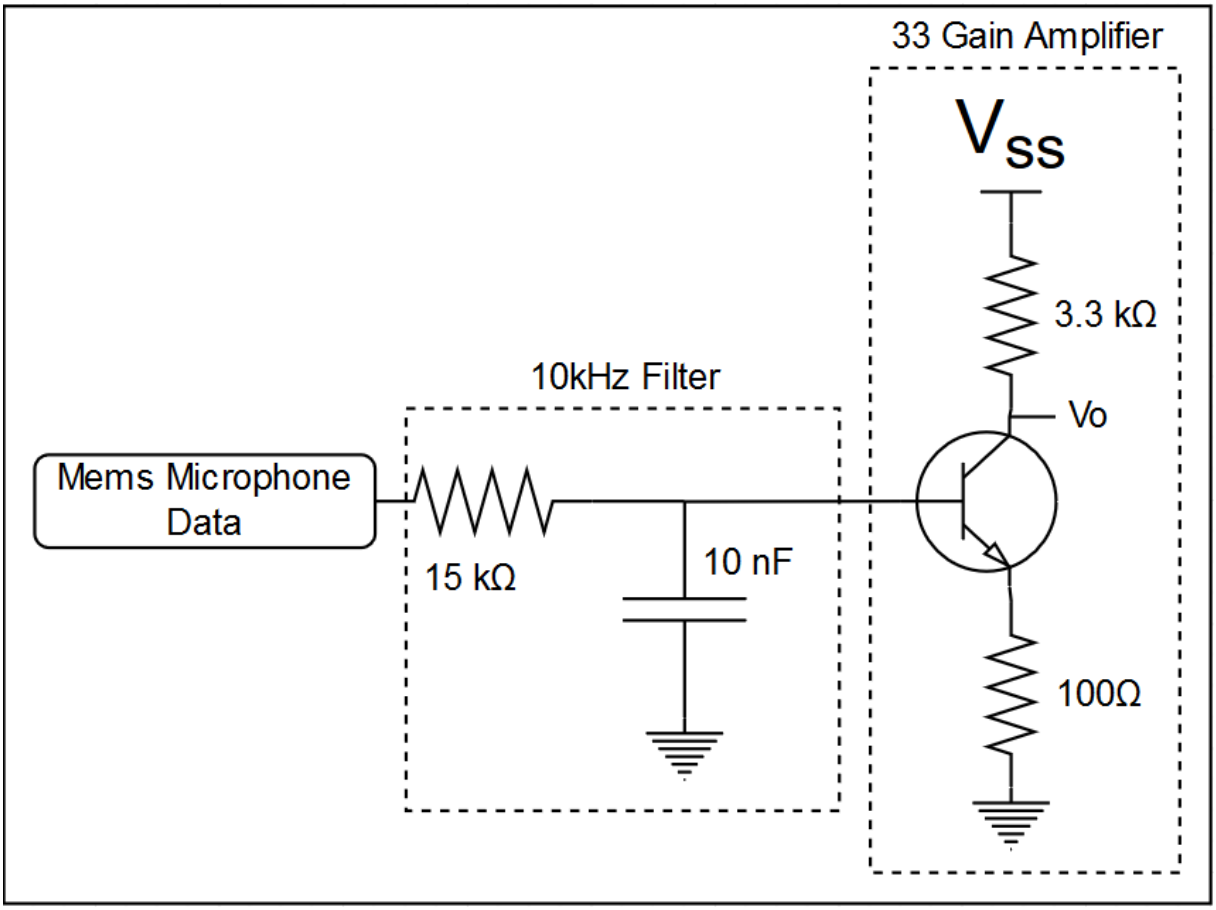
Mems microphones hardware :





Connect the output of the amplifier to analogs pin of the arduino.

Values of components :



SOFTWARE :

Python (Mems_record) :

Mems_record script : Here is just a script to record the microphones, clean the data and store it into an array, after that, the program plot the signal of the microphones.

Read_data script :

Here, thanks to pyaudio, we can read the text file which contain the data and hear the sound recorded by each microphones separately.

We took a sample rate of (baud-rate/CHUNK).

We are also able to produce a wave file of the sound recorded.

Main_Program :

In the main program there are the recorded function.

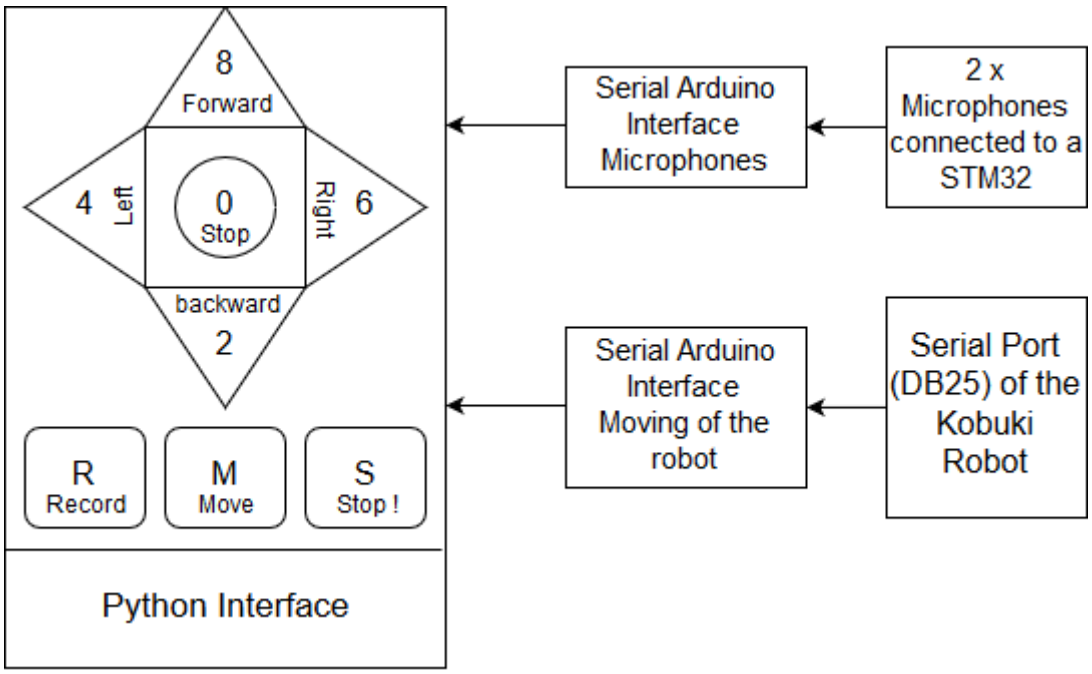
We enter in a loop which is define by a time, after that we can enter to the arduino serial to move the robot or enter to the stm32 serial to record data. For each record, we have a different text file.

Arduino :

Mems : We just reading the data of the Mems microphones and plot it on the serial.

Move_kobuki : We define the pin of the robot. After, we made a function to check if the bumper of the kobuki are activated when he go to a wall or against an obstacle. After that, there are the function to change the speed when we press a button.

When the bumper are used, the robot will go to a random direction. Else, we can change the direction of the robot using the Serial and with some commands (8,6,2,4,0).



If you have any question, you can contact me on this mail : louis.leroux@isen.yncrea.fr