FCTUC FACULDADE DE CIÊNCIAS
E TECNOLOGIA
UNIVERSIDADE DE COIMBRA

Licenciatura em Engenharia Informática

TECNOLOGIA DOS COMPUTADORES Year 2018/2019

Laboratorial assignment # 2

Interactive LED chase effect

Components list:

- Arduino UNO
- 1 USB cable
- 1 white breadboard
- 6 LEDs (any color)
- 6 220 Ohm resistors
- 1 Potentiometer
- 22 wires
- Software: Arduino IDE

1. LED Chase effect

Observe figure 1 and the string of LEDs. The chase effect is known for being the effect of lighting a single LED in a cyclic way, creating the illusion of the light moving along the string of LEDs. The light then "moves" in one direction until the end of the string and then starts from that position and moves back in the opposite direction. This behavior is repeated indefinitely.

Mount a string of 6 LEDs in the board, by connecting all negative poles of the LEDs (shorter wire) to the GND (0V) and the positive poles (longer one) to a 220 Ohm resistor and then to the 6 digital inputs.

Write a program that produces the LED chase effect with a frequency of 2Hz.

Upload and test your program.

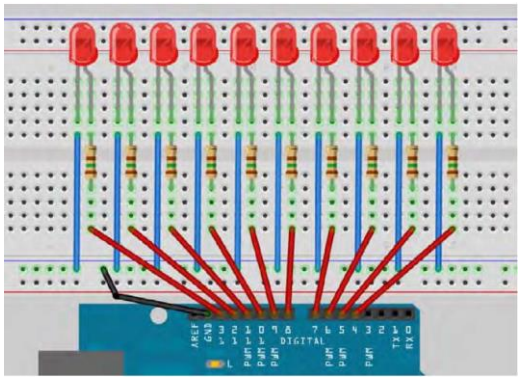

Fig. 1 – LED string for a chase effect.

2. Interactive LED Chase effect

A potentiometer consists of an adjustable resistor whose value varies as function of a rotating button from 0 Ohm to its maximum (in the case of this work 10 kOhm). It usually has three pins: connect the leftmost pin to 0V, the rightmost pin to +5V and the middle one to an analog input pin of Arduino. Plug the potentiometer as explained above by choosing the analog pin you want to read from.

The analog pins of the Arduino UNO can read a voltage value between 0V and +5V and translate it to a digital value between 0 and 1023 (10 bits conversion).

Write a program to read the potentiometer value and produce a LED chase effect where the delay between each LED transition is the value read from the potentiometer.

Upload and test your program.

3. Bouncing ball

Write a program to make a bouncing ball effect by making the LED start at one end, 'drop' toward the other end, bounce back up, but to only go up 5 spaces, bounce, go up 4 spaces, then 3, etc. This should give the effect of a bouncing ball.

Upload and test your program.