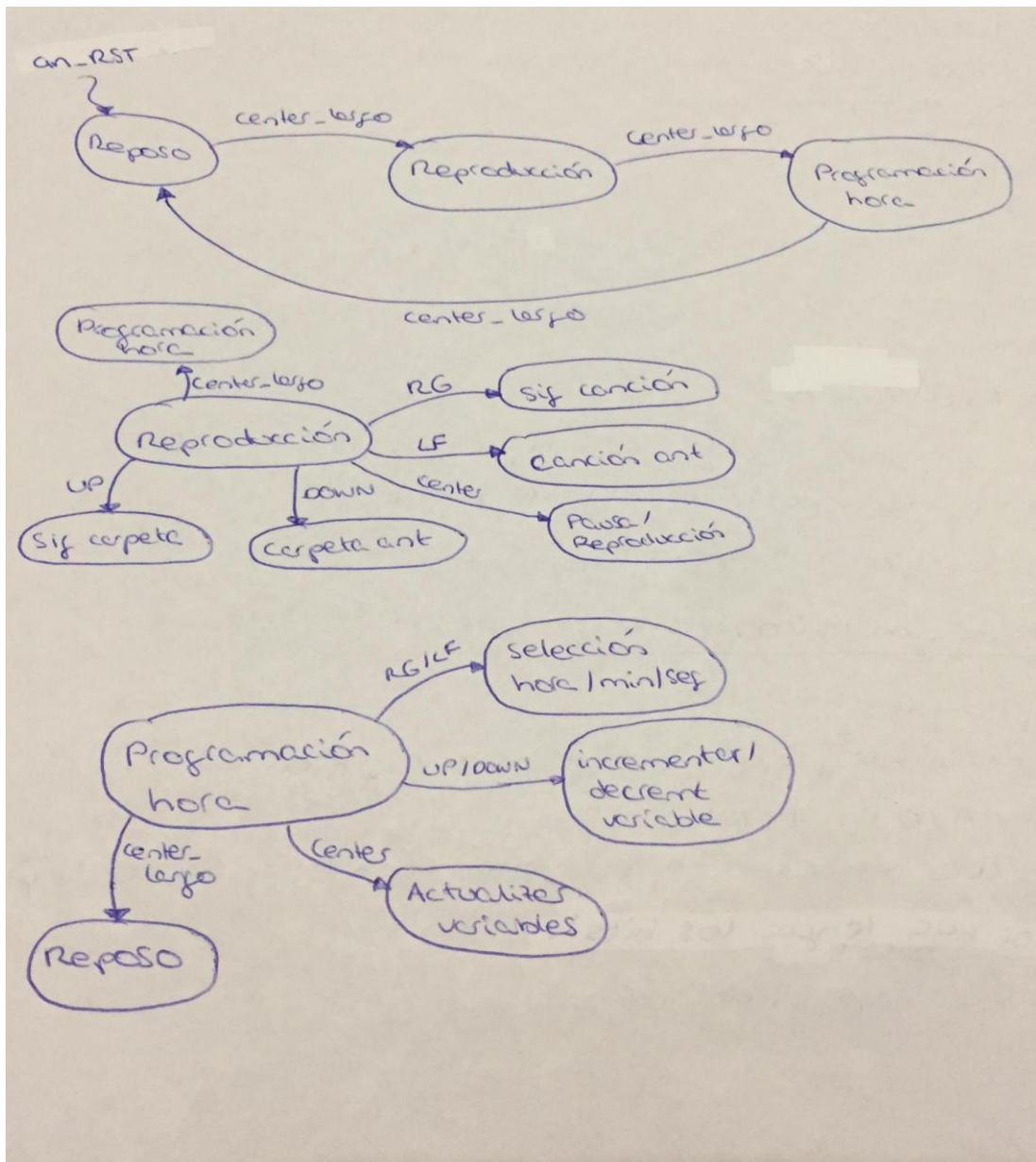Víctor Bernardos González

Laura Azcona Alonso

SEMANA 1:

Vamos a hacer tres autómatas uno general y dos específicos de los modos reproducción y programación hora.

Led rgb:

Funciona a nivel bajo y tiene los pines correspondientes:

#define PORT_RGB 2

#define RED_PIN 3

#define GREEN_PIN 2

#define BLUE_PIN 1

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Sensor de temperatura:

Utilizamos I2C un bus de comunicación síncrona con señal SCL (señal de reloj) y SCA (señal de datos). Las direcciones son configurables:

7.3 Slave address

The LM75B slave address on the I²C-bus is partially defined by the logic applied to the device address pins A2, A1 and A0. Each of them is typically connected either to GND for logic 0, or to V$_{CC}$ for logic 1. These pins represent the three LSB bits of the device 7-bit address. The other four MSB bits of the address data are preset to '1001' by hard wiring inside the LM75B. Table 4 shows the device's complete address and indicates that up to 8 devices can be connected to the same bus without address conflict. Because the input pins, SCL, SDA and A2 to A0, are not internally biased, it is important that they should not be left floating in any application.

Table 4.   Address table
1 = HIGH; 0 = LOW.

MSB						LSB
1	0	0	1	A2	A1	A0

10010000→0x90   #define ADDR 0X90

MSByte								LSByte							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0	X	X	X	X	X

When reading register Temp, all 16 bits of the two data bytes (MSByte and LSByte) are provided to the bus and must be all collected by the controller to complete the bus operation. However, only the 11 most significant bits should be used, and the 5 least significant bits of the LSByte are zero and should be ignored. One of the ways to calculate the Temp value in °C from the 11-bit Temp data is:

1. If the Temp data MSByte bit D10 = 0, then the temperature is positive and Temp value (°C) = +(Temp data) × 0.125 °C.

2. If the Temp data MSByte bit D10 = 1, then the temperature is negative and Temp value (°C) = −(two's complement of Temp data) × 0.125 °C.

Examples of the Temp data and value are shown in Table 10.

A la hora de calcular la temperatura el sensor te devuelve un valor en ºC .

valorHexa = ((buffer[0]<<8)|buffer[1])>>5;//son 11bits lo que devuelve D10-D3 y luego D2-D0
D0 corresponde al bit 5

 SignoTemp = valorHexa>>10;//D10 bit de signo de la temperatura

  //En función del signo se calcularía de una manera:

 temperatura = valorHexa*0.125; //positivo

temperatura = valorHexa*(-0.125); //negativo

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Zumbador:

Controlado con PWM. Su puerto y pin es:

#define PORT_BUZZ 2

#define BUZZER_PIN 0