

Prof. Me. Renato Alves Ferreira  
email: [renato.ferreira@fmu.br](mailto:renato.ferreira@fmu.br)

Disciplina:

*MICROCONTROLADORES*

# Agenda

- ✓ Apresentação do simulador EdSim51
- ✓ Exemplo de uso e programação em Assembly
- ✓ Atividade
- ✓ Desenvolvimento do projeto para APS



**Baixar de:**

**<https://www.edsim51.com/>**

<https://www.edsim51.com/>

P0.7	1	Display-select Decoder CS DAC WR
P0.6	1	Keypad Column 2
P0.5	1	Keypad Column 1
P0.4	1	Keypad Column 0
P0.3	1	Keypad Row 3
P0.2	1	Keypad Row 2
P0.1	1	Keypad Row 1
P0.0	1	Keypad Row 0
P1.7	1	LED 7 Seg. dp DAC DB7 LCD DB7
P1.6	1	LED 6 Seg. g DAC DB6 LCD DB6
P1.5	1	LED 5 Seg. f DAC DB5 LCD DB5
P1.4	1	LED 4 Seg. e DAC DB4 LCD DB4
P1.3	1	LED 3 ... d ...DB3 ...DB3 ... RS
P1.2	1	LED 2 ... c ...DB2 ...DB2 LCD E
P1.1	1	LED 1 Seg. b DAC DB1 LCD DB1
P1.0	1	LED 0 Seg. a DAC DB0 LCD DB0
P2.7	1	SW 7 ADC DB7
P2.6	1	SW 6 ADC DB6
P2.5	1	SW 5 ADC DB5
P2.4	1	SW 4 ADC DB4
P2.3	1	SW 3 ADC DB3
P2.2	1	SW 2 ADC DB2
P2.1	1	SW 1 ADC DB1
P2.0	1	SW 0 ADC DB0
P3.7	1	ADC RD Comparator Output
P3.6	1	ADC WR
P3.5	1	Motor Sensor
P3.4	1	Display-select Input 1
P3.3	1	AND Gate Output Display-select 0
P3.2	1	ADC INTR
P3.1	1	Motor Control Bit 1 Ext. UART Rx
P3.0	1	Motor Control Bit 0 Ext. UART Tx

## Ligações e pinagens do 8051 no Edsin51

P0.7	1	Display-select Decoder CS DAC WR
P0.6	1	Keypad Column 2
+ P0.5	1	Keypad Column 1
P0.4	1	Keypad Column 0
P0.3	1	Keypad Row 3
P0.2	1	Keypad Row 2
P0.1	1	Keypad Row 1
P0.0	1	Keypad Row 0
P1.7	1	LED 7 Seg. dp DAC DB7 LCD DB7
P1.6	1	LED 6 Seg. g DAC DB6 LCD DB6
+ P1.5	1	LED 5 Seg. f DAC DB5 LCD DB5
P1.4	1	LED 4 Seg. e DAC DB4 LCD DB4
P1.3	1	LED 3 ... d ..DB3 ..DB3 .. RS
P1.2	1	LED 2 ... c ..DB2 ..DB2 LCD E
P1.1	1	LED 1 Seg. b DAC DB1 LCD DB1
P1.0	1	LED 0 Seg. a DAC DB0 LCD DB0
P2.7	1	SW 7 ADC DB7
P2.6	1	SW 6 ADC DB6
+ P2.5	1	SW 5 ADC DB5
P2.4	1	SW 4 ADC DB4
P2.3	1	SW 3 ADC DB3
P2.2	1	SW 2 ADC DB2
P2.1	1	SW 1 ADC DB1
P2.0	1	SW 0 ADC DB0
P3.7	1	ADC RD Comparator Output
P3.6	1	ADC WR
+ P3.5	1	Motor Sensor
P3.4	1	Display-select Input 1
P3.3	1	AND Gate Output Display-select 0
P3.2	1	ADC INTR
P3.1	1	Motor Control Bit 1 Ext. UART Rx
P3.0	1	Motor Control Bit 0 Ext. UART Tx

# Painel com registradores E memória

Ports de I/O

Registradores

Visualizar memória de dados  
ou de programa

EdSim51DI - Version 2.1.20

System Clock (MHz) 12.0

SBUF

R/O	W/O	TH0	TL0
0x00	0x00	0x00	0x00
RXD	TXD	TMOD	0x00
1	1	TCOD	0x00
SCON	0x00		

pins bits

0xFF	0xFF	P3	0x00	0x00
0xFF	0xFF	P2		
0xFF	0xFF	P1		
0xFF	0xFF	P0		

TH1 TL1

0x00	0x00
------	------

PC

0x0000

8051

ACC 0 0 0 0 0 0 0 0

Modify RAM

addr 0x00 0x00 value

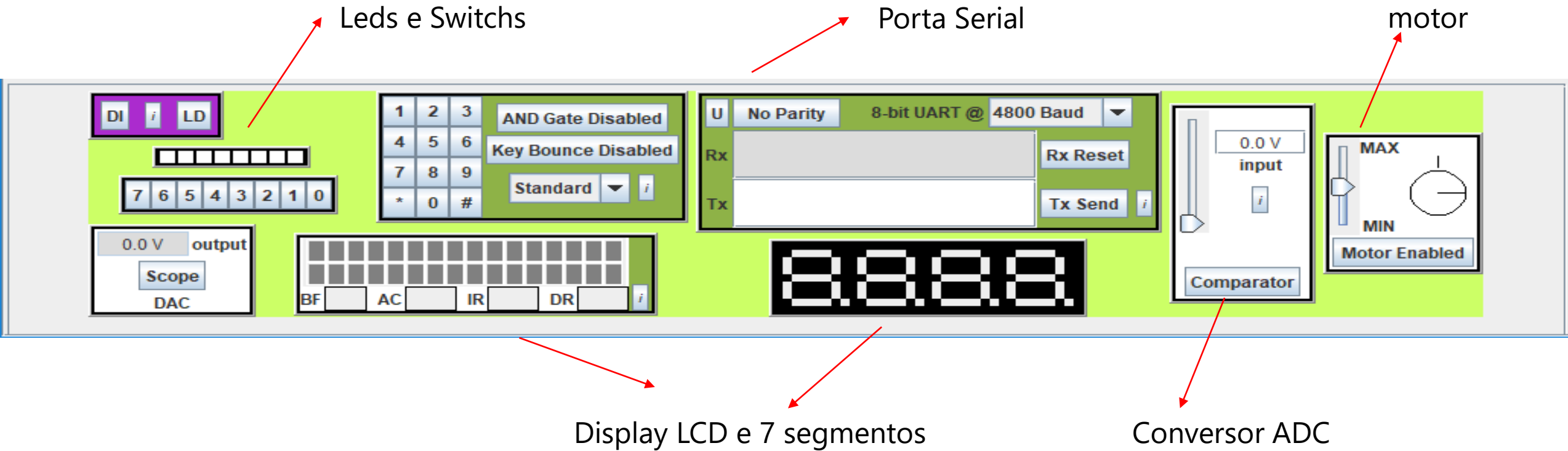
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Remove All Breakpoints

Copyright ©2005-2016 James Rogers

# Periféricos

## Dispositivos de I/O



# Configuração e mapeamento do Edsim

EdSim51DI - Dynamic Interface



P 1 . 4 Display-select Decoder CS  
P 0 . 7 DAC WR  
P 1 . 0 LED 0  
P 1 . 0 Seg. a  
P 1 . 0 DAC DB0  
P 1 . 0 LCD DB0  
P 1 . 1 LED 1  
P 1 . 1 Seg. b  
P 1 . 1 DAC DB1  
P 1 . 2 LCD DB1  
P 1 . 3 LED 2  
P 1 . 4 Seg. c  
P 1 . 5 DAC DB2  
P 1 . 6 LCD DB2  
P 1 . 7 LCD E  
P 1 . 3 LED 3  
P 1 . 3 Seg. d

P 1 . 5 LED 5  
P 1 . 5 Seg. f  
P 1 . 5 DAC DB5  
P 1 . 5 LCD DB5  
P 1 . 6 LED 6  
P 1 . 6 Seg. g  
P 1 . 6 DAC DB6  
P 1 . 6 LCD DB6  
P 1 . 7 LED 7  
P 1 . 7 Seg. dp  
P 1 . 7 DAC DB7  
P 1 . 7 LCD DB7  
P 2 . 0 SW 0  
P 2 . 0 ADC DB0  
P 2 . 1 SW 1  
P 2 . 1 ADC DB1  
P 2 . 2 SW 2

P 2 . 6 SW 6  
P 2 . 6 ADC DB6  
P 2 . 7 SW 7  
P 2 . 7 ADC DB7  
P 3 . 0 Motor Control Bit 0  
P 3 . 0 Ext. UART Tx  
P 3 . 1 Motor Control Bit 1  
P 3 . 1 Ext. UART Rx  
P 3 . 2 ADC INTR  
P 3 . 3 AND Gate Output  
P 3 . 3 Display-select Input 0  
P 3 . 4 Display-select Input 1  
P 3 . 5 Motor Sensor  
P 3 . 6 ADC WR  
P 3 . 7 ADC RD  
P 3 . 7 Comparator Output

Alterar bits

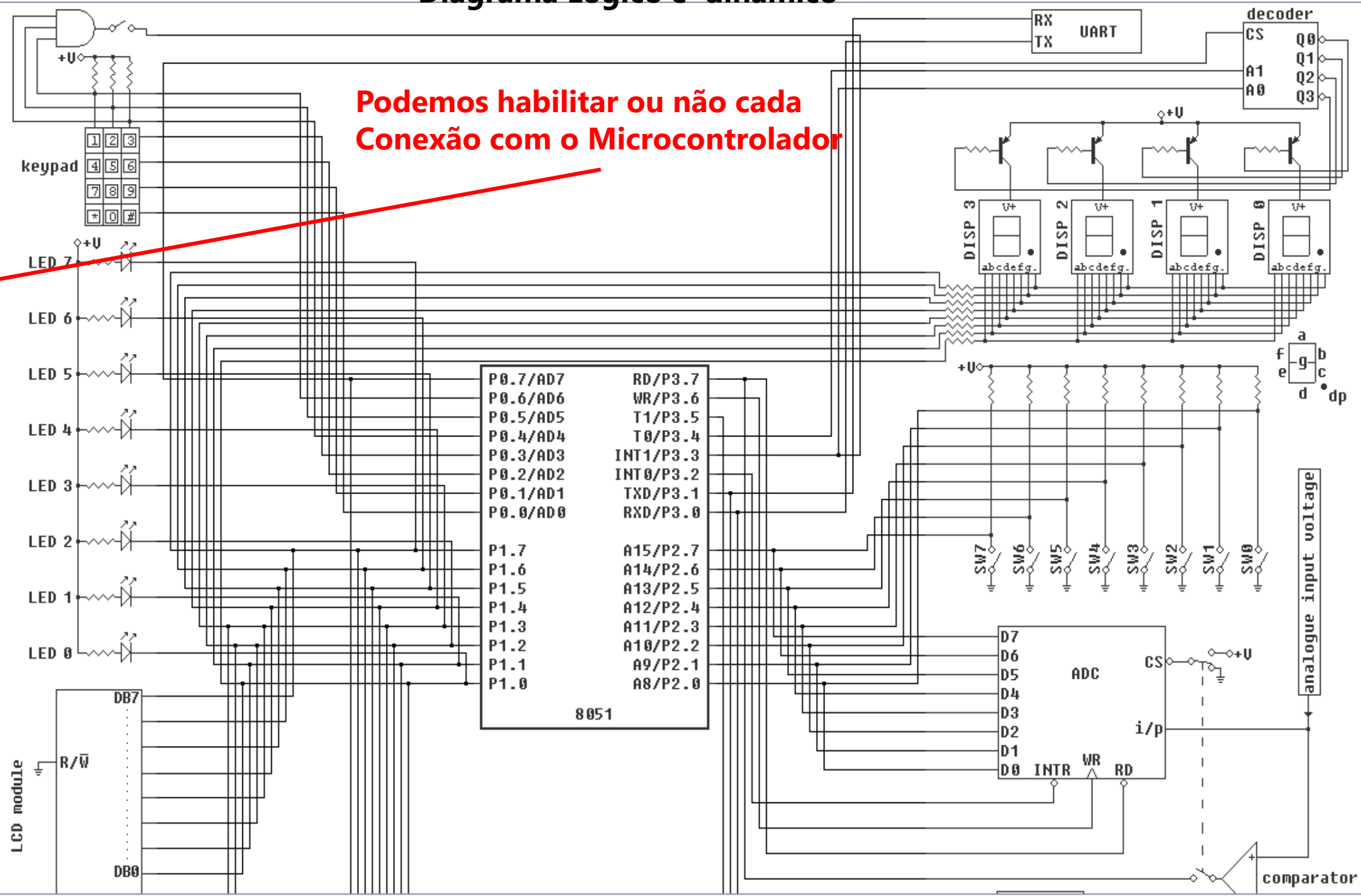


Save

Cancel

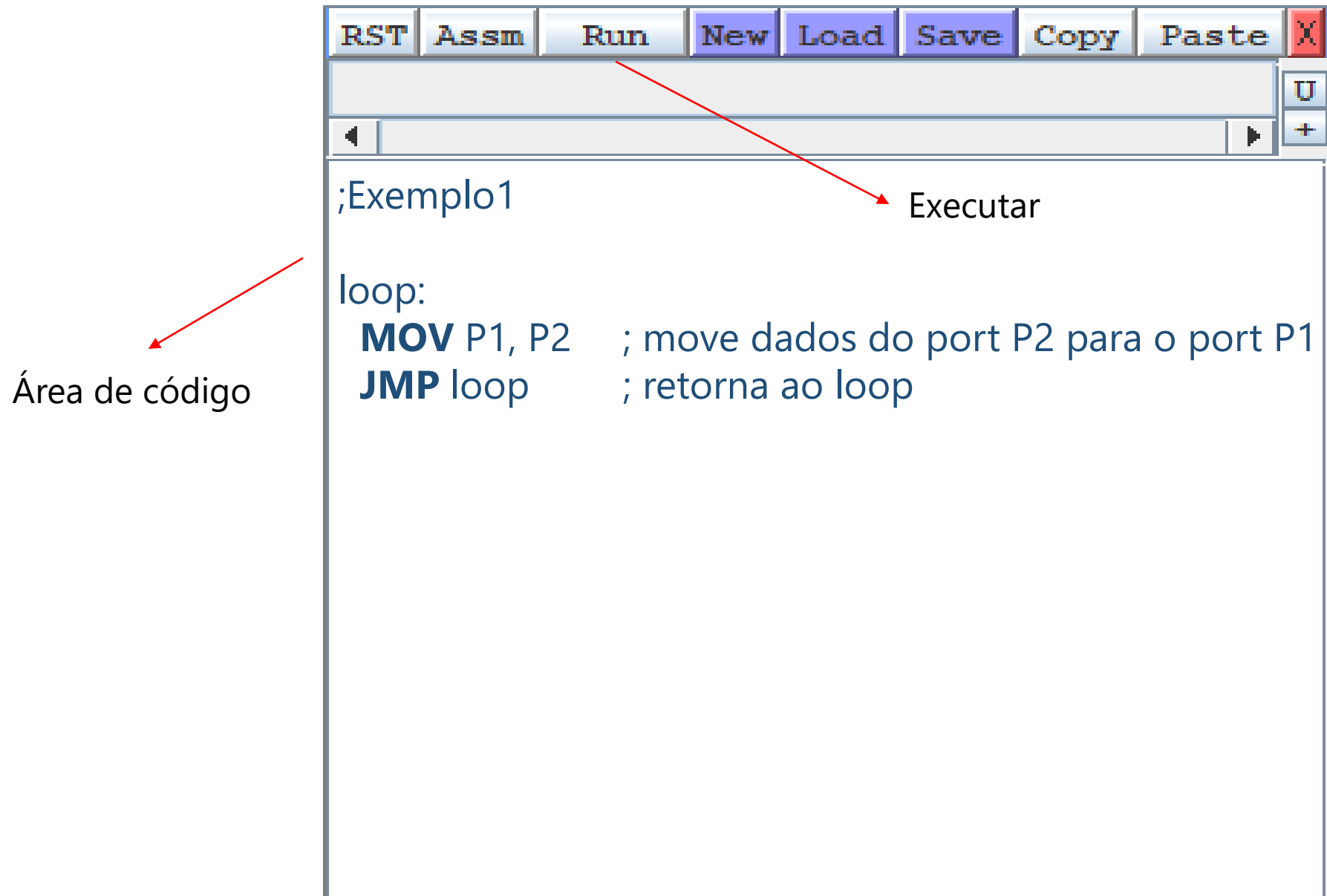
Restart required for settings to take effect.

- ☒ Switch Bank
  - ☒ LED Bank
  - ☒ Digital-to-analogue Converter
  - ☒ Keypad
  - ☒ LCD Module
  - ☒ Uart
  - ☒ Multiplexed 7-segment Display
  - ☒ Analogue-to-digital Converter
  - ☒ Comparator
  - ☒ Motor
- Select All
- Deselect All

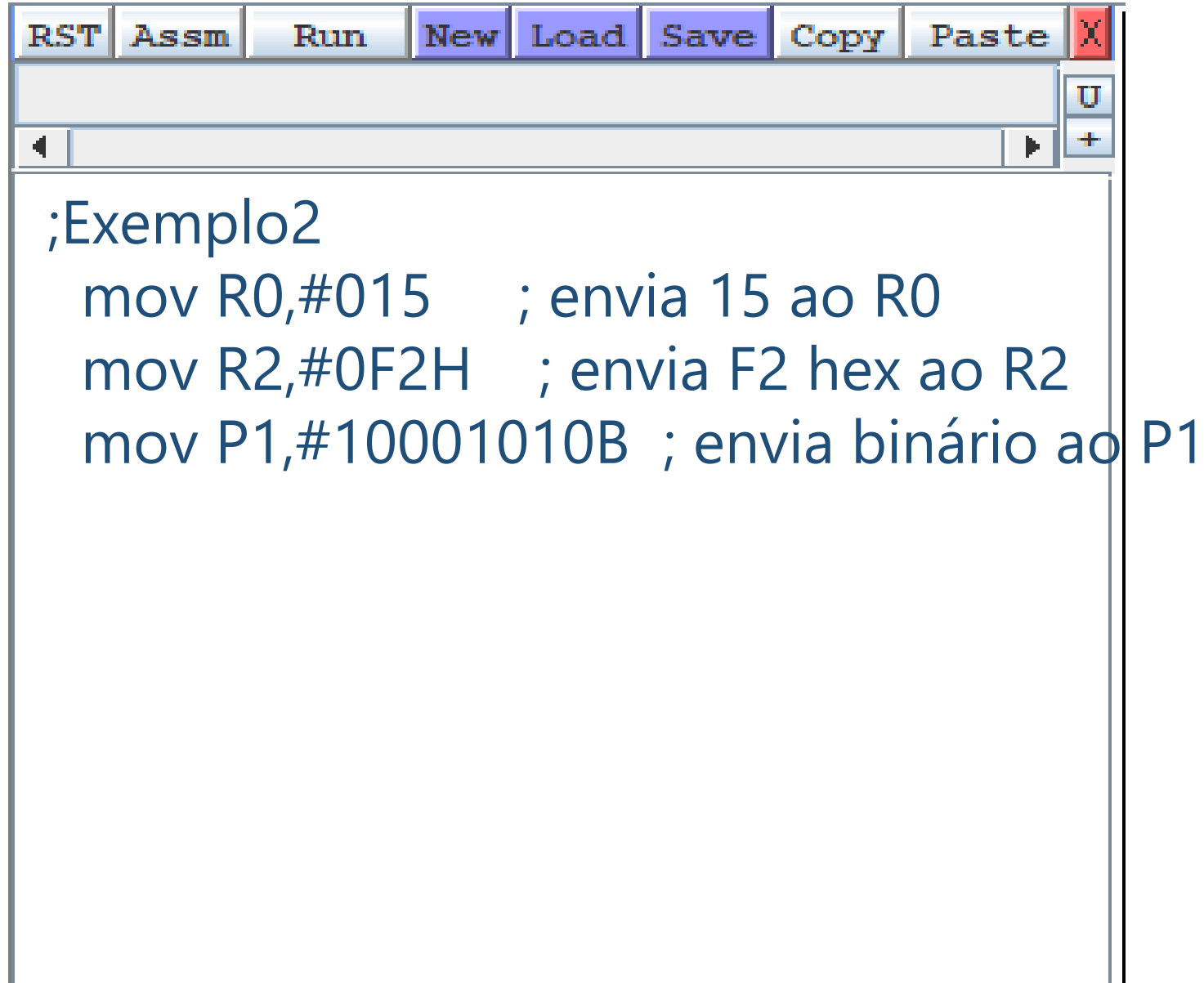




# Exemplos de códigos em Assembly



# Exemplos de códigos em Assembly



The image shows a screenshot of a software application window, likely an assembly editor. The window has a title bar with standard Windows controls (minimize, maximize, close). Below the title bar is a menu bar with the following items: RST, Assm, Run, New, Load, Save, Copy, Paste, and a red 'X' button. Below the menu bar is a toolbar with a 'U' button and a '+' button. The main area of the window contains the following assembly code:

```
;Exemplo2  
mov R0,#015    ; envia 15 ao R0  
mov R2,#0F2H   ; envia F2 hex ao R2  
mov P1,#10001010B ; envia binário ao P1
```

## Atividade

- Testar os programas e promover ajustes dos registradores, portas e valores e observar as variações na memória de dados, memória de programa, dos registradores, portas de I/O e demais componentes.

**Te espero na próxima aula!**