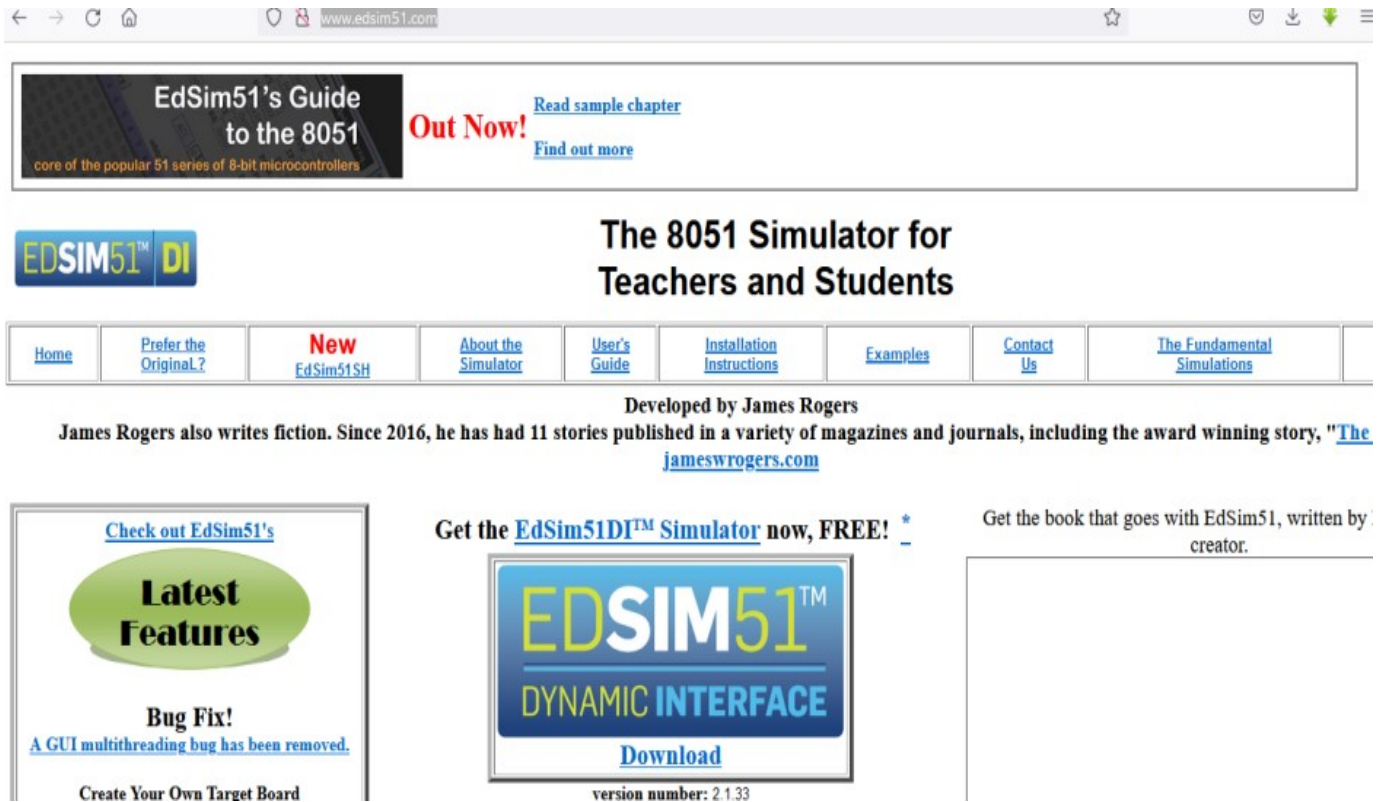


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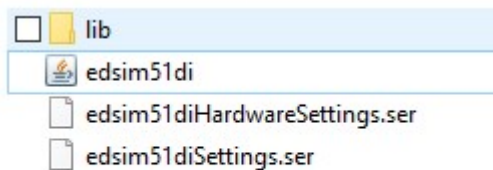
INTRODUCTION OF EDSIM51

1. <http://www.edsim51.com/>



The screenshot shows the homepage of the EdSim51 website. At the top, there is a navigation bar with links: Home, Prefer the Original?, New EdSim51SH, About the Simulator, User's Guide, Installation Instructions, Examples, Contact Us, and The Fundamental Simulations. Below the navigation bar, there is a section titled "The 8051 Simulator for Teachers and Students" with a sub-header "Developed by James Rogers". A paragraph mentions that James Rogers also writes fiction and has published 11 stories since 2016. Below this, there are three main promotional boxes. The first box on the left is titled "Check out EdSim51's Latest Features" and mentions a "Bug Fix!" where a GUI multithreading bug has been removed. The middle box is titled "Get the EdSim51DI™ Simulator now, FREE!" and features a large "EDSIM51™ DYNAMIC INTERFACE" logo with a "Download" button and the version number "2.1.33". The right box is titled "Get the book that goes with EdSim51, written by creator." and is currently empty.

2. Just click on edsim51di jar file



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EdSim51DI - Version 2.1.20

System Clock (MHz) 12.0 100 Update Freq.

SBUF

R/O	W/O	TH0	TL0	R7	B
0x00	0x00	0x00	0x00	0x00	0x00

RXD TXD

R/O	W/O	TH0	TL0	R7	B
1	1	0x00	0x00	0x00	0x00

SCON 0x00 TCON 0x00

pins bits

R/O	W/O	TH0	TL0	R7	B
0xFF	0xFF	0x00	0x00	0x00	0x00

PC 8051

ACC 0 0 0 0 0 0 0 0

Modify RAM

Data Memory

addr	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
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

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RST Assm Run New Load Save Copy Paste

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-se..t 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

DI LD

1 2 3 AND Gate Disabled
4 5 6 Key Bounce Disabled
7 8 9 Standard
* 0 #

U Even Parity 8-bit UART @ 4800 Baud

Rx Rx Reset
Tx Tx Send

0.0 V output
Scope
DAC

BF AC IR DR

8.8.8.8

0.0 V input
11111111
ADC

MAX
MIN
Motor Disabled



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3. Executing a program

The screenshot displays the EdSim51DI software interface. The top section shows the assembly code being executed:

```

RST Assm Run New Load Save Copy Paste
Reset: PC = 0x0000
MOV A, #12H
MOV R0, #20H
ADD A, R0
EXIT: JMP EXIT
    
```

The register window shows the PC at 8051 and the ACC at 0x0000. The memory window shows the program memory starting at 0x0000. The bottom section shows the hardware simulation, including a keypad, a display, and various peripheral devices like the DAC, ADC, and motor.

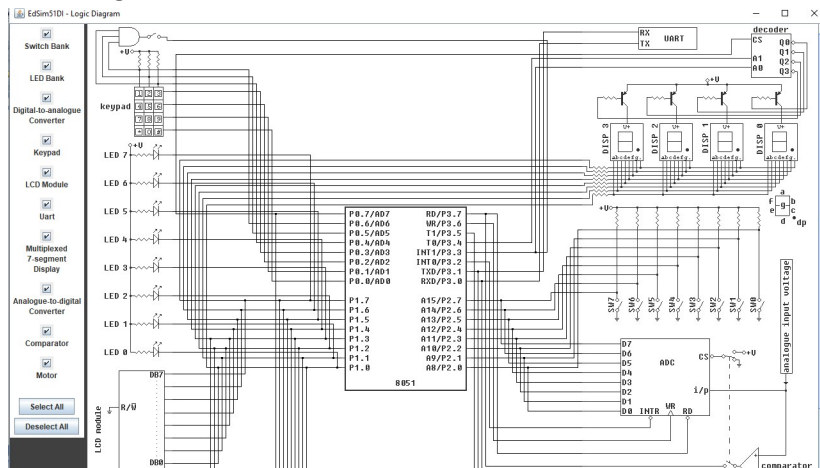
4. Connections of other peripheral devices

The screenshot displays the EdSim51DI - Dynamic Interface window, showing the connections for various peripheral devices. The connections are listed in three columns:

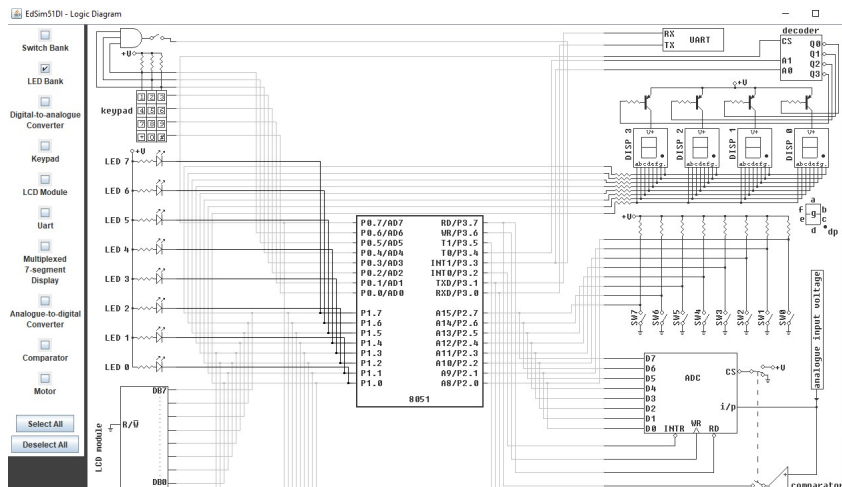
Port	Device	Port	Device	Port	Device
P 0	Keypad Row 0	P 1	DAC DB3	P 2	ADC DB2
P 0	Keypad Row 1	P 1	LCD DB3	P 2	SW 3
P 0	Keypad Row 2	P 1	LCD RS	P 2	ADC DB3
P 0	Keypad Row 3	P 1	LED 4	P 2	SW 4
P 0	Keypad Column 0	P 1	Seg. e	P 2	ADC DB4
P 0	Keypad Column 1	P 1	DAC DB4	P 2	SW 5
P 0	Keypad Column 2	P 1	LCD DB4	P 2	ADC DB5
P 0	Display-select Decoder CS	P 1	LED 5	P 2	SW 6
P 0	DAC WR	P 1	Seg. f	P 2	ADC DB6
P 1	LED 0	P 1	DAC DB5	P 2	SW 7
P 1	Seg. a	P 1	LCD DB5	P 2	ADC DB7
P 1	DAC DB0	P 1	LED 6	P 3	Motor Control Bit 0
P 1	LCD DB0	P 1	Seg. g	P 3	Ext. UART Tx
P 1	LED 1	P 1	DAC DB6	P 3	Motor Control Bit 1
P 1	Seg. b	P 1	LCD DB6	P 3	Ext. UART Rx
P 1	DAC DB1	P 1	LED 7	P 3	ADC INTR



5. Interfacing connections and diagram



6. LED interfacing



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Program Execution in edsim51:

Addressing mode:

Immediate addressing mode:-

```
;MOV A,#25H  
;MOV DPTR,#4521H  
;END
```

Direct Addressign mode:-

```
;MOV A,25H  
;END
```

Register addressing mode:-

```
;MOV A,R5  
;MOV R7,DPL  
;END
```

Indirect addressing mode:-

```
;MOV @R0,25H  
;MOV A, @R0  
;END
```

Indexed addressing mode :-

```
MOVC A, @ A + DPTR  
MOVC A, @ A+ PC
```



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REGISTER BANK:

;REGISTER BANK R0 (DEFAULT REGISTER BANK)

```
;MOV R0,#10H  
;MOV R1,#11H  
;MOV R2,#12H  
;MOV R3,#13H  
;MOV R4,#14H  
;MOV R5,#15H  
;MOV R6,#16H  
;MOV R7,#17H
```

;REGISTER BANK R2 SET PSW AT #08H

```
;MOV PSW, #08H  
;MOV R0,#20H  
;MOV R1,#21H  
;MOV R2,#22H  
;MOV R3,#23H  
;MOV R4,#24H  
;MOV R5,#25H  
;MOV R6,#26H  
;MOV R7,#27H
```

;REGISTER BANK R2 SET PSW AT #10H

```
;MOV R0,#20H  
;MOV R1,#21H  
;MOV R2,#22H  
;MOV R3,#23H  
;MOV R4,#24H  
;MOV R5,#25H  
;MOV R6,#26H  
;MOV R7,#27H
```



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;REGISTER BANK R3 SET PSW AT #18H

```
;MOV PSW, #18H  
;MOV R0,#20H  
;MOV R1,#21H  
;MOV R2,#22H  
;MOV R3,#23H  
;MOV R4,#24H  
;MOV R5,#25H  
;MOV R6,#26H  
;MOV R7,#27H  
END
```



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CALL instruction:

Example 1:

```
;MOV R6,#25H  
;MOV R1,#12H  
;MOV R4,#0F3H  
;PUSH 6  
;PUSH 1  
;PUSH 4
```

```
;POP 8  
;POP 9  
;POP 0AH
```

```
MOV SP,#5FH  
MOV R2,#25H  
MOV R1,#12H  
MOV R4,#0F3H  
PUSH 2  
PUSH 1  
PUSH 4
```

Example 2:

```
;MOV R6,#25H  
;MOV R1,#12H  
;MOV R4,#0F3H  
;PUSH 6  
;PUSH 1  
;PUSH 4
```

```
;POP 8  
;POP 9  
;POP 0AH
```

```
MOV SP,#5FH
```



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```
MOV R2,#25H
MOV R1,#12H
MOV R4,#0F3H
PUSH 2
PUSH 1
PUSH 4
```

LOOP:

```
ORG 0000
MOV R0,#0H
MOV A,#55H
JZ NEXT
INC R0
AGAIN: INC A
INC A
NEXT: ADD A,#77H
JNC OVER
CLR A
MOV R0,A
MOV R1,A
MOV R2,A
MOV R3,A
OVER: ADD A,R3
JNC AGAIN
HERE: SJMP HERE
END
```



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Stack:

```
;MOV R6,#25H  
;MOV R1,#12H  
;MOV R4,#0F3H  
;PUSH 6  
;PUSH 1  
;PUSH 4
```

```
;POP 8  
;POP 9  
;POP 0AH
```

```
;MOV SP,#5FH  
;MOV R2,#25H  
;MOV R1,#12H  
;MOV R4,#0F3H  
;PUSH 2  
;PUSH 1  
;PUSH 4
```



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