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8051 Instruction Set Manual

Architecture Overview (is51_overview.htm)

Opcodes (is51_opcodes.htm)

Instructions (is51_instructions.htm)

(is51_instructions.htm) (default.htm) (is51_ov_cpupsw.htm) Opcodes

The following table lists the 8051 instructions by HEX code.

Hex Code	Bytes	Mnemonic	Operands
00	1	NOP (is51_nop.htm)	
01	2	AJMP (is51_ajmp.htm)	addr11
02	3	LJMP (is51_ljmp.htm)	addr16
03	1	RR (is51_rr.htm)	A
04	1	INC (is51_inc.htm)	A
05	2	INC (is51_inc.htm)	direct
06	1	INC (is51_inc.htm)	@R0
07	1	INC (is51_inc.htm)	@R1
08	1	INC (is51_inc.htm)	R0
09	1	INC (is51_inc.htm)	R1
0A	1	INC (is51_inc.htm)	R2
0B	1	INC (is51_inc.htm)	R3
0C	1	INC (is51_inc.htm)	R4
0D	1	INC (is51_inc.htm)	R5
0E	1	INC (is51_inc.htm)	R6
0F	1	INC (is51_inc.htm)	R7
10	3	JBC (is51_jbc.htm)	bit, offset
11	2	ACALL (is51_acall.htm)	addr11
12	3	LCALL (is51_lcall.htm)	addr16
13	1	RRC (is51_rrc.htm)	A
14	1	DEC (is51_dec.htm)	A
15	2	DEC (is51_dec.htm)	direct
16	1	DEC (is51_dec.htm)	@R0
17	1	DEC (is51_dec.htm)	@R1
18	1	DEC (is51_dec.htm)	R0
19	1	DEC (is51_dec.htm)	R1
1A	1	DEC (is51_dec.htm)	R2
1B	1	DEC (is51_dec.htm)	R3
1C	1	DEC (is51_dec.htm)	R4
1D	1	DEC (is51_dec.htm)	R5
1E	1	DEC (is51_dec.htm)	R6
1F	1	DEC (is51_dec.htm)	R7
20	3	JB (is51_jb.htm)	bit, offset
21	2	AJMP (is51_ajmp.htm)	addr11
22	1	RET (is51_ret.htm)	
23	1	RL (is51_rl.htm)	A
24	2	ADD (is51_add.htm)	A, #immed
25	2	ADD (is51_add.htm)	A, direct
26	1	ADD (is51_add.htm)	A, @R0
27	1	ADD (is51_add.htm)	A, @R1
28	1	ADD (is51_add.htm)	A, R0
29	1	ADD (is51_add.htm)	A, R1
2A	1	ADD (is51_add.htm)	A, R2
2B	1	ADD (is51_add.htm)	A, R3
2C	1	ADD (is51_add.htm)	A, R4
2D	1	ADD (is51_add.htm)	A, R5
2E	1	ADD (is51_add.htm)	A, R6
2F	1	ADD (is51_add.htm)	A, R7
30	3	JNB (is51_jnb.htm)	bit, offset
31	2	ACALL (is51_acall.htm)	addr11
32	1	RETI (is51_reti.htm)	
33	1	RLC (is51_rlc.htm)	A
34	2	ADDC (is51_addc.htm)	A, #immed
35	2	ADDC (is51_addc.htm)	A, direct

Hex Code	Bytes	Mnemonic	Operands
80	2	SJMP (is51_sjmp.htm)	offset
81	2	AJMP (is51_ajmp.htm)	addr11
82	2	ANL (is51_anl.htm)	C, bit
83	1	MOVC (is51_movc.htm)	A, @A+PC
84	1	DIV (is51_div.htm)	AB
85	3	MOV (is51_mov.htm)	direct, direct
86	2	MOV (is51_mov.htm)	direct, @R0
87	2	MOV (is51_mov.htm)	direct, @R1
88	2	MOV (is51_mov.htm)	direct, R0
89	2	MOV (is51_mov.htm)	direct, R1
8A	2	MOV (is51_mov.htm)	direct, R2
8B	2	MOV (is51_mov.htm)	direct, R3
8C	2	MOV (is51_mov.htm)	direct, R4
8D	2	MOV (is51_mov.htm)	direct, R5
8E	2	MOV (is51_mov.htm)	direct, R6
8F	2	MOV (is51_mov.htm)	direct, R7
90	3	MOV (is51_mov.htm)	DPTR, #immed
91	2	ACALL (is51_acall.htm)	addr11
92	2	MOV (is51_mov.htm)	bit, C
93	1	MOVC (is51_movc.htm)	A, @A+DPTR
94	2	SUBB (is51_subb.htm)	A, #immed
95	2	SUBB (is51_subb.htm)	A, direct
96	1	SUBB (is51_subb.htm)	A, @R0
97	1	SUBB (is51_subb.htm)	A, @R1
98	1	SUBB (is51_subb.htm)	A, R0
99	1	SUBB (is51_subb.htm)	A, R1
9A	1	SUBB (is51_subb.htm)	A, R2
9B	1	SUBB (is51_subb.htm)	A, R3
9C	1	SUBB (is51_subb.htm)	A, R4
9D	1	SUBB (is51_subb.htm)	A, R5
9E	1	SUBB (is51_subb.htm)	A, R6
9F	1	SUBB (is51_subb.htm)	A, R7
A0	2	ORL (is51_orl.htm)	C, /bit
A1	2	AJMP (is51_ajmp.htm)	addr11
A2	2	MOV (is51_mov.htm)	C, bit
A3	1	INC (is51_inc.htm)	DPTR
A4	1	MUL (is51_mul.htm)	AB
A5		reserved	
A6	2	MOV (is51_mov.htm)	@R0, direct
A7	2	MOV (is51_mov.htm)	@R1, direct
A8	2	MOV (is51_mov.htm)	R0, direct
A9	2	MOV (is51_mov.htm)	R1, direct
AA	2	MOV (is51_mov.htm)	R2, direct
AB	2	MOV (is51_mov.htm)	R3, direct
AC	2	MOV (is51_mov.htm)	R4, direct
AD	2	MOV (is51_mov.htm)	R5, direct
AE	2	MOV (is51_mov.htm)	R6, direct
AF	2	MOV (is51_mov.htm)	R7, direct
B0	2	ANL (is51_anl.htm)	C, /bit
B1	2	ACALL (is51_acall.htm)	addr11
B2	2	CPL (is51_cpl.htm)	bit
B3	1	CPL (is51_cpl.htm)	C
B4	3	CJNE (is51_cjne.htm)	A, #immed, offset
B5	3	CJNE (is51_cjne.htm)	A, direct, offset

36	1	ADDC (is51_addc.htm)	A, @R0
37	1	ADDC (is51_addc.htm)	A, @R1
38	1	ADDC (is51_addc.htm)	A, R0
39	1	ADDC (is51_addc.htm)	A, R1
3A	1	ADDC (is51_addc.htm)	A, R2
3B	1	ADDC (is51_addc.htm)	A, R3
3C	1	ADDC (is51_addc.htm)	A, R4
3D	1	ADDC (is51_addc.htm)	A, R5
3E	1	ADDC (is51_addc.htm)	A, R6
3F	1	ADDC (is51_addc.htm)	A, R7
40	2	JC (is51_jc.htm)	offset
41	2	AJMP (is51_ajmp.htm)	addr11
42	2	ORL (is51_orl.htm)	direct, A
43	3	ORL (is51_orl.htm)	direct, #immed
44	2	ORL (is51_orl.htm)	A, #immed
45	2	ORL (is51_orl.htm)	A, direct
46	1	ORL (is51_orl.htm)	A, @R0
47	1	ORL (is51_orl.htm)	A, @R1
48	1	ORL (is51_orl.htm)	A, R0
49	1	ORL (is51_orl.htm)	A, R1
4A	1	ORL (is51_orl.htm)	A, R2
4B	1	ORL (is51_orl.htm)	A, R3
4C	1	ORL (is51_orl.htm)	A, R4
4D	1	ORL (is51_orl.htm)	A, R5
4E	1	ORL (is51_orl.htm)	A, R6
4F	1	ORL (is51_orl.htm)	A, R7
50	2	JNC (is51_jnc.htm)	offset
51	2	ACALL (is51_acall.htm)	addr11
52	2	ANL (is51_anl.htm)	direct, A
53	3	ANL (is51_anl.htm)	direct, #immed
54	2	ANL (is51_anl.htm)	A, #immed
55	2	ANL (is51_anl.htm)	A, direct
56	1	ANL (is51_anl.htm)	A, @R0
57	1	ANL (is51_anl.htm)	A, @R1
58	1	ANL (is51_anl.htm)	A, R0
59	1	ANL (is51_anl.htm)	A, R1
5A	1	ANL (is51_anl.htm)	A, R2
5B	1	ANL (is51_anl.htm)	A, R3
5C	1	ANL (is51_anl.htm)	A, R4
5D	1	ANL (is51_anl.htm)	A, R5
5E	1	ANL (is51_anl.htm)	A, R6
5F	1	ANL (is51_anl.htm)	A, R7
60	2	JZ (is51_jz.htm)	offset
61	2	AJMP (is51_ajmp.htm)	addr11
62	2	XRL (is51_xrl.htm)	direct, A
63	3	XRL (is51_xrl.htm)	direct, #immed
64	2	XRL (is51_xrl.htm)	A, #immed
65	2	XRL (is51_xrl.htm)	A, direct
66	1	XRL (is51_xrl.htm)	A, @R0
67	1	XRL (is51_xrl.htm)	A, @R1
68	1	XRL (is51_xrl.htm)	A, R0
69	1	XRL (is51_xrl.htm)	A, R1
6A	1	XRL (is51_xrl.htm)	A, R2
6B	1	XRL (is51_xrl.htm)	A, R3
6C	1	XRL (is51_xrl.htm)	A, R4
B6	3	CJNE (is51_cjne.htm)	@R0, #immed, offset
B7	3	CJNE (is51_cjne.htm)	@R1, #immed, offset
B8	3	CJNE (is51_cjne.htm)	R0, #immed, offset
B9	3	CJNE (is51_cjne.htm)	R1, #immed, offset
BA	3	CJNE (is51_cjne.htm)	R2, #immed, offset
BB	3	CJNE (is51_cjne.htm)	R3, #immed, offset
BC	3	CJNE (is51_cjne.htm)	R4, #immed, offset
BD	3	CJNE (is51_cjne.htm)	R5, #immed, offset
BE	3	CJNE (is51_cjne.htm)	R6, #immed, offset
BF	3	CJNE (is51_cjne.htm)	R7, #immed, offset
C0	2	PUSH (is51_push.htm)	direct
C1	2	AJMP (is51_ajmp.htm)	addr11
C2	2	CLR (is51_clr.htm)	bit
C3	1	CLR (is51_clr.htm)	C
C4	1	SWAP (is51_swap.htm)	A
C5	2	XCH (is51_xch.htm)	A, direct
C6	1	XCH (is51_xch.htm)	A, @R0
C7	1	XCH (is51_xch.htm)	A, @R1
C8	1	XCH (is51_xch.htm)	A, R0
C9	1	XCH (is51_xch.htm)	A, R1
CA	1	XCH (is51_xch.htm)	A, R2
CB	1	XCH (is51_xch.htm)	A, R3
CC	1	XCH (is51_xch.htm)	A, R4
CD	1	XCH (is51_xch.htm)	A, R5
CE	1	XCH (is51_xch.htm)	A, R6
CF	1	XCH (is51_xch.htm)	A, R7
D0	2	POP (is51_pop.htm)	direct
D1	2	ACALL (is51_acall.htm)	addr11
D2	2	SETB (is51_setb.htm)	bit
D3	1	SETB (is51_setb.htm)	C
D4	1	DA (is51_da.htm)	A
D5	3	DJNZ (is51_djnz.htm)	direct, offset
D6	1	XCHD (is51_xchd.htm)	A, @R0
D7	1	XCHD (is51_xchd.htm)	A, @R1
D8	2	DJNZ (is51_djnz.htm)	R0, offset
D9	2	DJNZ (is51_djnz.htm)	R1, offset
DA	2	DJNZ (is51_djnz.htm)	R2, offset
DB	2	DJNZ (is51_djnz.htm)	R3, offset
DC	2	DJNZ (is51_djnz.htm)	R4, offset
DD	2	DJNZ (is51_djnz.htm)	R5, offset
DE	2	DJNZ (is51_djnz.htm)	R6, offset
DF	2	DJNZ (is51_djnz.htm)	R7, offset
E0	1	MOVX (is51_movx.htm)	A, @DPTR
E1	2	AJMP (is51_ajmp.htm)	addr11
E2	1	MOVX (is51_movx.htm)	A, @R0
E3	1	MOVX (is51_movx.htm)	A, @R1
E4	1	CLR (is51_clr.htm)	A
E5	2	MOV (is51_mov.htm)	A, direct
E6	1	MOV (is51_mov.htm)	A, @R0
E7	1	MOV (is51_mov.htm)	A, @R1
E8	1	MOV (is51_mov.htm)	A, R0
E9	1	MOV (is51_mov.htm)	A, R1
EA	1	MOV (is51_mov.htm)	A, R2
EB	1	MOV (is51_mov.htm)	A, R3

6D	1	XRL (is51_xrl.htm)	A, R5
6E	1	XRL (is51_xrl.htm)	A, R6
6F	1	XRL (is51_xrl.htm)	A, R7
70	2	JNZ (is51_jnz.htm)	offset
71	2	ACALL (is51_acall.htm)	addr11
72	2	ORL (is51_orl.htm)	C, bit
73	1	JMP (is51_jmp.htm)	@A+DPTR
74	2	MOV (is51_mov.htm)	A, #immed
75	3	MOV (is51_mov.htm)	direct, #immed
76	2	MOV (is51_mov.htm)	@R0, #immed
77	2	MOV (is51_mov.htm)	@R1, #immed
78	2	MOV (is51_mov.htm)	R0, #immed
79	2	MOV (is51_mov.htm)	R1, #immed
7A	2	MOV (is51_mov.htm)	R2, #immed
7B	2	MOV (is51_mov.htm)	R3, #immed
7C	2	MOV (is51_mov.htm)	R4, #immed
7D	2	MOV (is51_mov.htm)	R5, #immed
7E	2	MOV (is51_mov.htm)	R6, #immed
7F	2	MOV (is51_mov.htm)	R7, #immed

EC	1	MOV (is51_mov.htm)	A, R4
ED	1	MOV (is51_mov.htm)	A, R5
EE	1	MOV (is51_mov.htm)	A, R6
EF	1	MOV (is51_mov.htm)	A, R7
F0	1	MOVX (is51_movx.htm)	@DPTR, A
F1	2	ACALL (is51_acall.htm)	addr11
F2	1	MOVX (is51_movx.htm)	@R0, A
F3	1	MOVX (is51_movx.htm)	@R1, A
F4	1	CPL (is51_cpl.htm)	A
F5	2	MOV (is51_mov.htm)	direct, A
F6	1	MOV (is51_mov.htm)	@R0, A
F7	1	MOV (is51_mov.htm)	@R1, A
F8	1	MOV (is51_mov.htm)	R0, A
F9	1	MOV (is51_mov.htm)	R1, A
FA	1	MOV (is51_mov.htm)	R2, A
FB	1	MOV (is51_mov.htm)	R3, A
FC	1	MOV (is51_mov.htm)	R4, A
FD	1	MOV (is51_mov.htm)	R5, A
FE	1	MOV (is51_mov.htm)	R6, A
FF	1	MOV (is51_mov.htm)	R7, A