Computer Science CSCI 261

Computer Architecture and Assembly Language

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HC11 Instruction Set

68HC11 Instruction Set

Each addressing mode shows the opcode, #cyles and # bytes. - means the addressing mode is not valid for that instruction.

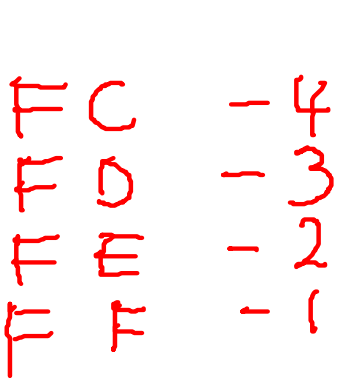
instruct.	Imm / rel	direct	ind,x	ind,y	extend	inherent	explanation	h i n z v c
aba	-- - -	-- - -	-- - -	-- - -	-- - -	1b 2 1	A=(A)+(B)	x - x x x x
abx	-- - -	-- - -	-- - -	-- - -	-- - -	3a 3 1	IX=(IX)+(B)	- - - - - -
aby	-- - -	-- - -	-- - -	-- - -	-- - -	183a 4 1	IY=(IY)+(B)	- - - - - -
adca	89 2 2	99 3 2	a9 4 2	18a9 5 3	b9 4 3	-- - -	A=(A)+(M)+(C)	x - x x x x
adcb	c9 2 2	d9 3 2	e9 4 2	18e9 5 3	f9 4 3	-- - -	B=(B)+(M)+(C)	x - x x x x
adda	8b 2 2	9b 3 2	ab 4 2	18ab 4 2	bb 4 3	-- - -	A=(A)+(M)	x - x x x x
addb	cb 2 2	db 3 2	eb 4 2	18eb 5 3	fb 4 3	-- - -	B=(B)+(M)	x - x x x x
addd	c3 3 4	d3 5 2	e3 6 2	18e3 7 3	f3 6 3	-- - -	D=(D)+(M;M+1)	- - x x x x
anda	84 2 2	94 3 2	a4 4 2	18a4 5 3	b4 4 3	-- - -	A=(A)&(M)	- - x x 0 -

Sigma N (HC11)

- Files
  - `Makefile`
  - `sigman.s`
  - `bats.script`
  - `bats.gdb`
  - `sigman.lst`
  - `sigman.s19`

Relative Addressing

```
25                loop:
26 0003 1B                aba          ; acca:= acca + accb
27 0004 5A                decb          ; decrement accb
28 0005 26 FC              bne loop
```



Relative Addressing

Size and Speed

Address	Mnemonic	Opcode (Value)	Cycles	Bytes	Mode
2000	clra	4F	2	1	inherent
2001	ldab	C6	2	2	immediate
2002		04			
2003	aba	1B	2	1	inherent
2004	decb	5a	2	1	inherent
2005	bne	26	3	2	relative
2006		FC			
2007	staa	B7	4	3	extended
2008		20			
2009		0B			
200A		CF	2	1	inherent
200B		00			

S19 Record

```
S00D00007369676D616E2E73313968^M
S10F20004FC6041B5A26FCB7200B3F00FF^M
S9032000DC^M
```

Starting address

Machine code

Data