

## Lecture 02.01 A paper computer

condition code register

Consider the following graphic. It is an example of how a program running on a Motorola 68HC12 microcontroller might proceed at the memory/register/assembly language level. The HC12 registers are different than the ARM registers discussed in Lecture 01.03, but there are some differences. For instance, the HC12's *condition code register* (CCR) is akin to the ARM application status register (APSR). Begin with the program counter (PC) at memory address 3007 and follow the corresponding instructions, annotating the registers as appropriate.

Memory Address	Memory Contents	Instruction Mnemonics	Comment
2080	05		LOCATION OF AUGEND
2081	FB		LOCATION OF ADDEND
2082			LOCATION OF SUM
.	.	.	
.	.	.	
.	.	.	
3007	B6	BEGIN: LDAA AUGEND	PUT AUGEND IN A
3008	20		
3009	80		
300A	BB	ADDA ADDEND	ADD THE ADDEND
300B	20		
300C	81		
300D	7A	STAA SUM	STORE THE RESULT
300E	20		
300F	82		
3010	20	HERE: BRA HERE	ENDLESS LOOP HERE
3011	FE		

A	B
D	

X
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Y
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SP
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PC
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S	X	H	I	N	Z	V	C
CCR							

Instruction Queue (Pipeline) ←									
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