

ICS hw4

Question 1

The instruction add Register 5 with 0x3333 and it can't be showed by immediate number

it should the ADD R5,R5,R3

x1000 0001_1011_0100_0011

Question 2

a) 将存储在R0中的数字左移一定次数，这个次数根据x3007内存单元存储的内容决定

b)

PC	x3006
R0	x0050
R1	x0000
R2	x0000
R3	x0000
R4	x0000
R5	x0000
R6	x0000
R7	x0000
N	false
Z	true
P	false

c)

Memory location	Total cycle
x3000	10
x3001	10
x3002	17
x3003	40
x3004	40
x3005	43

Total Cycle=160

Question 3

统计存放在内存单元x3100一个程序字的1的个数

Question 4

Memory location	Value
x3001	0110_0010_0000_0000
x3002	0000_1000_0000_0010

Question 5

因为存在LDI和STI指令直接对立即数操作

Question 6

PC增量相对寻址，相对于增量PC是-1

LD R1,#-1

Question 7

error：立即数太大了

可以将加30分成三十条+1

Question 8

$R1 = R1 - 3 * N$

$N = 4$ $R1 = R1 - 12 < 0$ and $R1 = E1 - 9 \geq 0$ $9 \leq R1 < 12$

Question 9

a)

Symbol	location
Loop	x3003
L1	x300A
NEXT	x300B
DONE	x300D
NUMBERS	x300E

b)

从存储在内存x4000的数字开始遍历整个数组，直到遇到-1结束

R4是这个数组中偶数的个数，R3是奇数的个数

Question 10

这个程序的功能是找到一个整数n，满足以下两个条件

$$2^n \geq R1 \text{ and } 2^{n-1} < R1$$

Question 11

- a) LDR R3,R1,#0
- b) NOT R4,R4
- c) ADD R4,R4,#1

Question 12

Add an Instruction between BRp CHECK and STR R0,R2,#1

LD R2,VECTOR

Question 13

a)

Register	Value
R0	X300B
R1	X300D
R2	X000A
R3	X1263
R4	X300B

b)

Address	Value
Addr1	x300B
Addr2	x000A
Addr3	x000A
Addr4	x300B
Addr5	x300D

