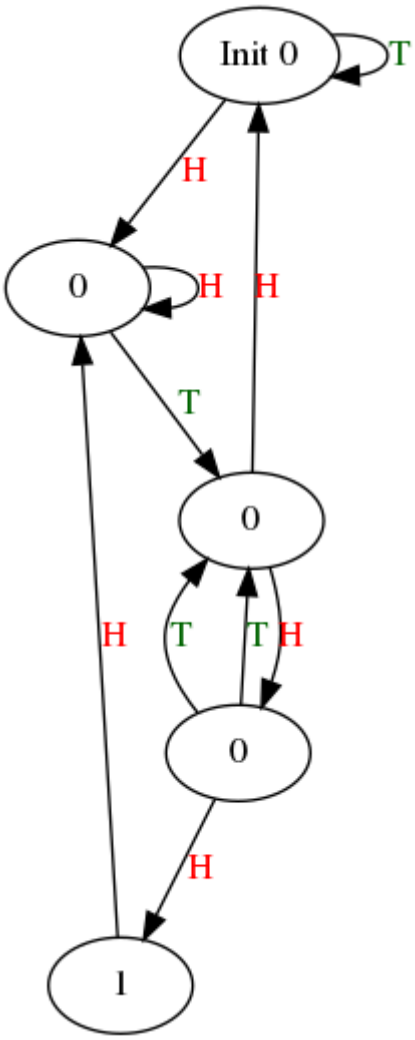
hw03

1.

a. state diagram



b. 3 bits for that $2^3 = 8$while $2^4 = 16, 2^2 = 4$ and there are 5 states

2.

$2^7 * 16 = 2048$

3.

a.

01,1

b.

$2^{10} = 1024 > 800 > 512 = 2^9$ That means we need 10 bits of adress line

They will still be 3

c.

we can add $2^{10} - 800$ (i.e.),224 more locations and not have to increase the width of the program counter.

4.

a. $2^2 = 4$

b. 16

c. 8

d.

WE	A[1:0]	Di[15:0]	D[15:0]	Write/Read
0	01	xFADE	x4567	R
1	10	xDEAD	xDEAD	W
0	00	xBEFF	x0123	R
1	11	xFEED	xFEED	W

5.

6.

PC program counter

IR instruction regesiter

CC nzp condition codes

...

	PC	IR	MAR	MDR	R0	R1	R2	R3	R4	R5	R6	R7
FETHC	x3004	x62BE	X3003	X62BE	X3000	X3000	X3002	X3000	X3000	X3000	X3000	X3000
DECODE	x3004	x62BE	X3003	X62BE	X3000	X3000	X3002	X3000	X3000	X3000	X3000	X3000
EVAL	x3004	x62BE	X3003	X62BE	X3000	X3000	X3002	X3000	X3000	X3000	X3000	X3000
FETCHOP	x3004	x62BE	X3000	X62BF	X3000	X3000	X3002	X3000	X3000	X3000	X3000	X3000
EXE	x3004	x62BE	X3000	X62BE	X3000	X3000	X3002	X3000	X3000	X3000	X3000	X3000
STORE	x3004	x62BE	X3000	X62BE	X3000	X62EF	X3002	X3000	X3000	X3000	X3000	X3000

7.

a. $2^{11} = 2048 > 1511 > 1024 = 2^{10}$

b. $2^6 = 64$

c. 32-3*6-11=3

8.

> 0101000000100000
>
> 1001011010111111
>
> 0001011011100001
>
> 0001001001000011
>
> 0000101000000001
>
> 0001000000100001
>
> 1111000000100101

9.

if R2 >= 9

mov R4 , $1 ; IMM num

else

mov R4, $0