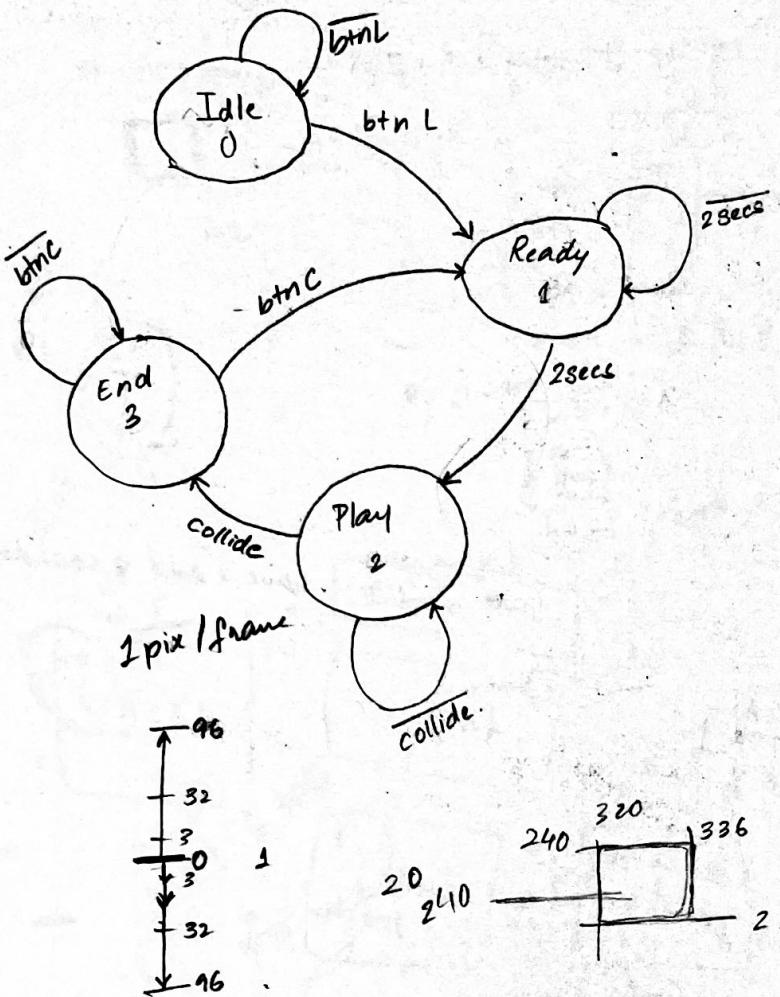


Game Logic State machine.

Lab - 7

- game .

(1)

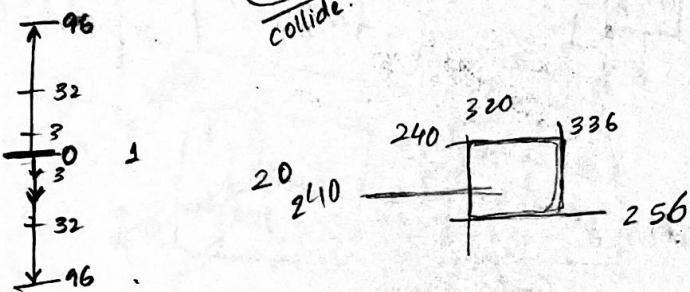


A	B
7seg 0000 frog not moving plants not moving	

- B: frog blink twice.
- C: Score increase
- D: frog blinks & score blinks.

- 1
 - o lab 7 clks ✓
 - o game- counter
 - o VGA controller
 - o ring /sel /hex 7seg ✓
 - o state machine
 - o LED output
 - o frame - counter
 - o pixel - counter

$$hf - diff \\ (4 - 240)$$



Lab 7: Early Pl 3433

Procedure

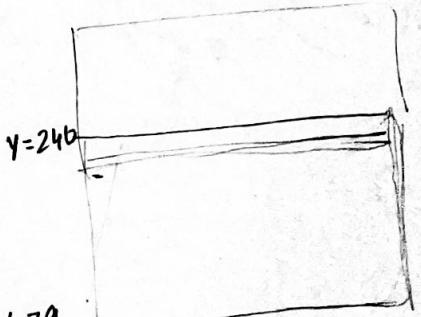
5/19

3:01 pm

240 -

Off - (y - 240)

y -



479

$$\boxed{\text{ }} \quad x = a \\ \boxed{\text{ }} \quad x = b = (a + 16)$$

$$\boxed{\text{ }} \quad x = a + diff \\ \boxed{\text{ }} \quad x = (a + diff) + 16$$

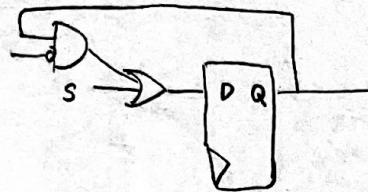
$$\boxed{\text{ }} \quad x = a + big diff$$

- State Machine
- VGA controller
- 10 bit counter
- Edge detector

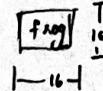
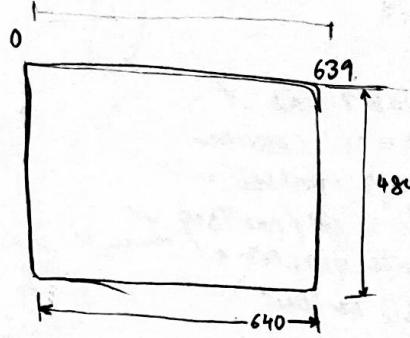
1.2

Lab - 7

SR flip-flop using D flip flops

H-active ≤ 639

$$D = S + \bar{R} Q$$

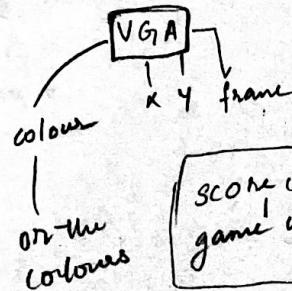


plant module.

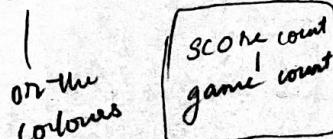
have x and y coords

frog.

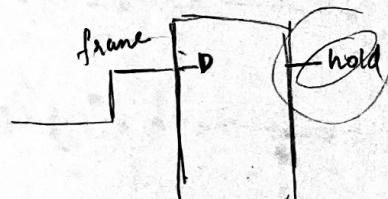
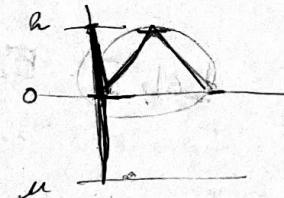
LFSR

Frog mechanics

period \rightarrow 32 frames?
 vertical state \rightarrow 3 pix/frame.
 goes back to center

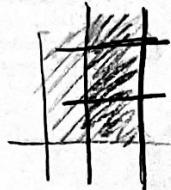
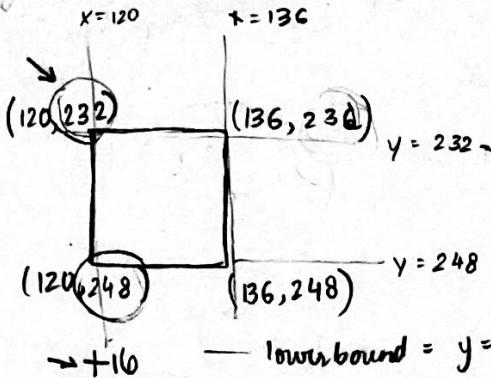


State machine

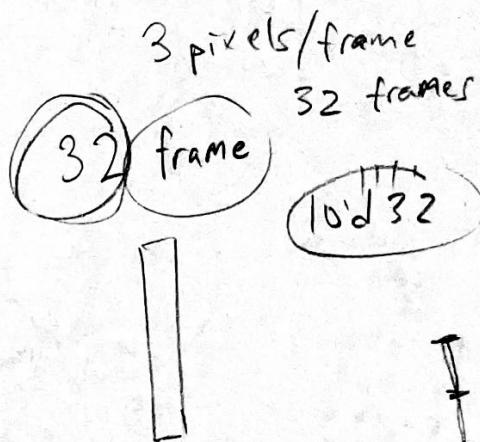
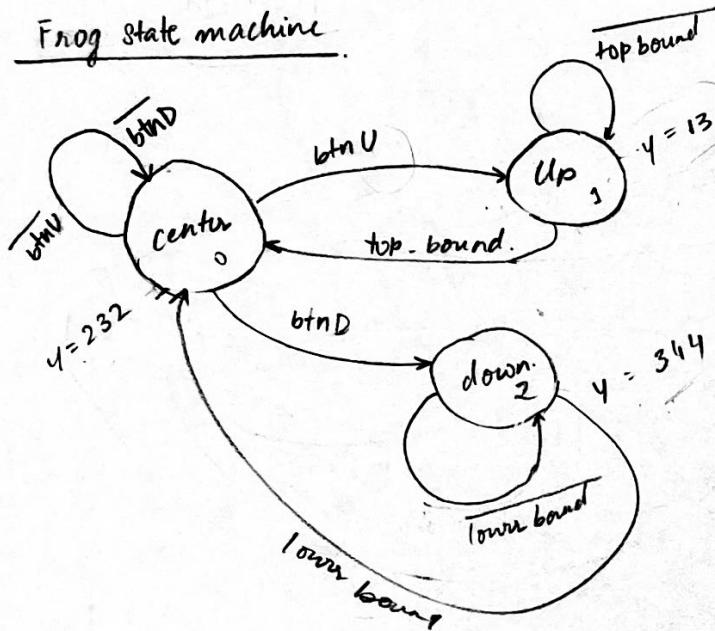


Frog up bound $y = 136$ Lab - 7/11/12

(2)



Frog state machine



$$\frac{1}{1} : \underline{0}$$

7:4
10

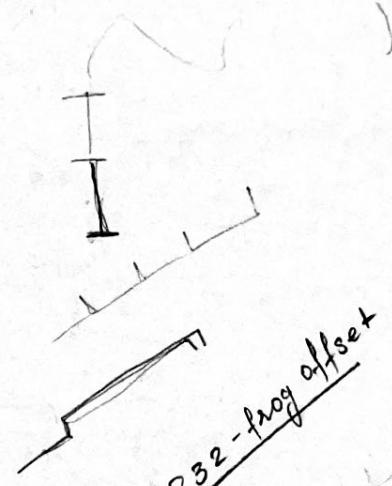
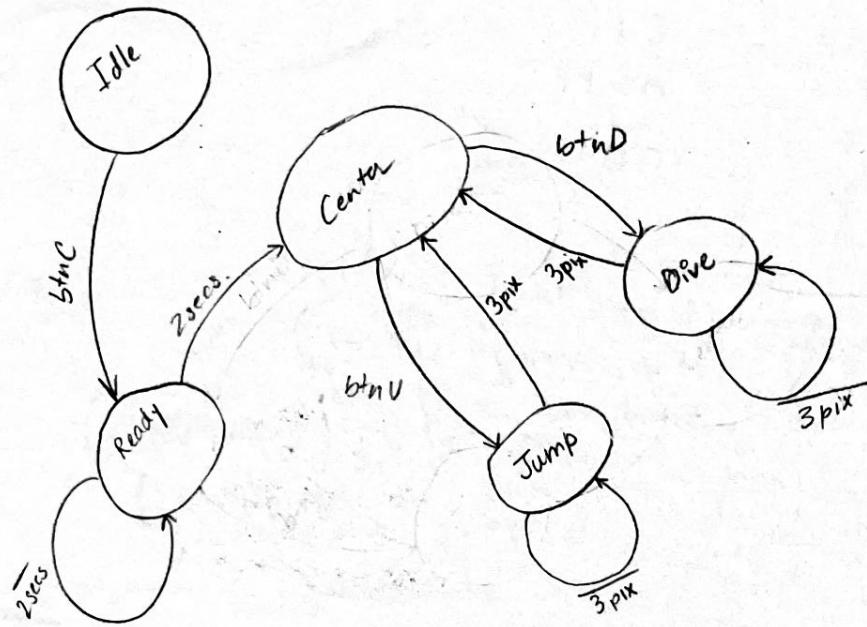
frog-active
(condition)? expression:
plant plant color
(condition)? expression:
blue-active
(condition)? expression:

water-depth
[
- 10'd 240 - y-output
-
-
-]

3
6
-4
-7

1000	0011
1100	0110
0110	1100
0011	1001
1001	0011
0100	

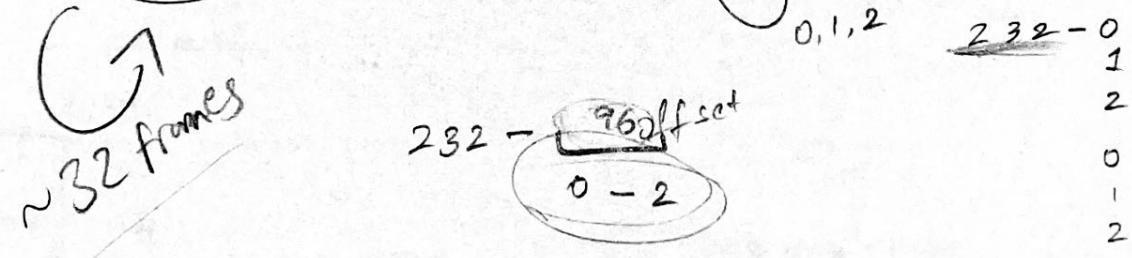
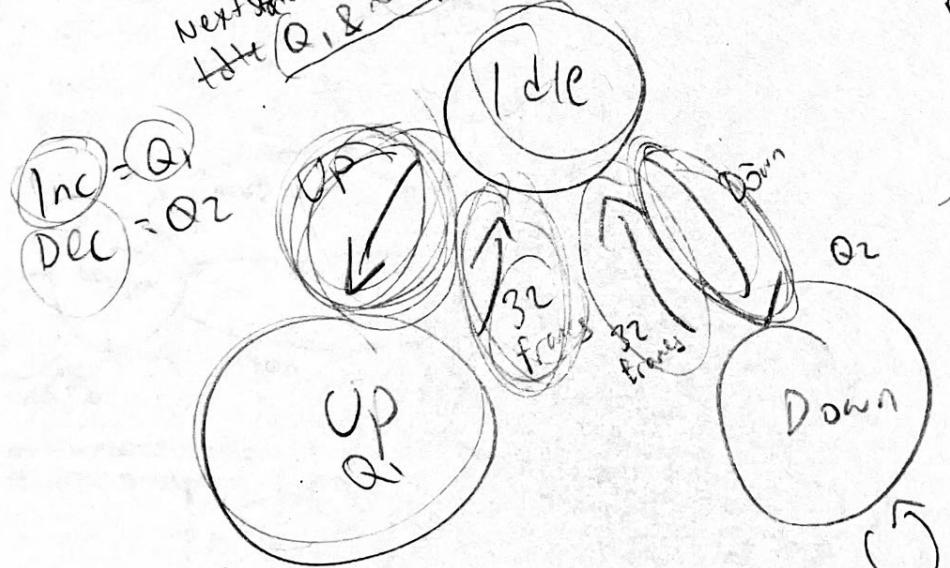
2.5 Lab - 7



$\begin{array}{c} 232 \\ 232 \\ 232 \\ \hline 23 \end{array}$

move frog = 232 - 0
 $\begin{array}{c} 232 \\ 232 \\ 232 \\ \hline 23 \end{array}$

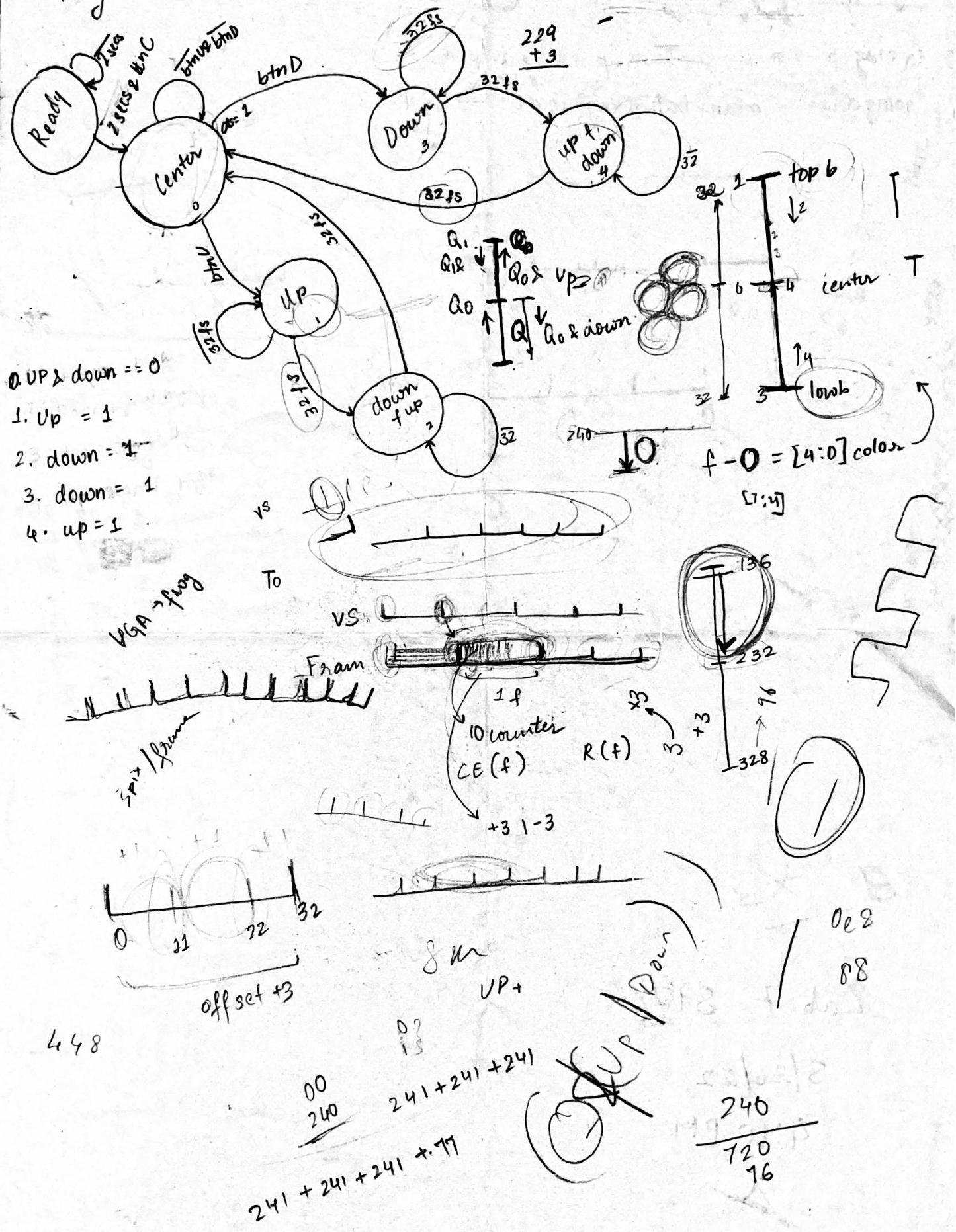
$\begin{array}{c} 232 - 0 \\ 232 - 3 \\ 232 - 6 \\ 232 - 9 \\ \hline \end{array}$



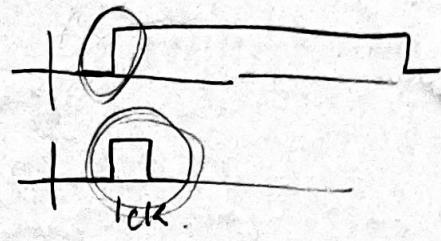
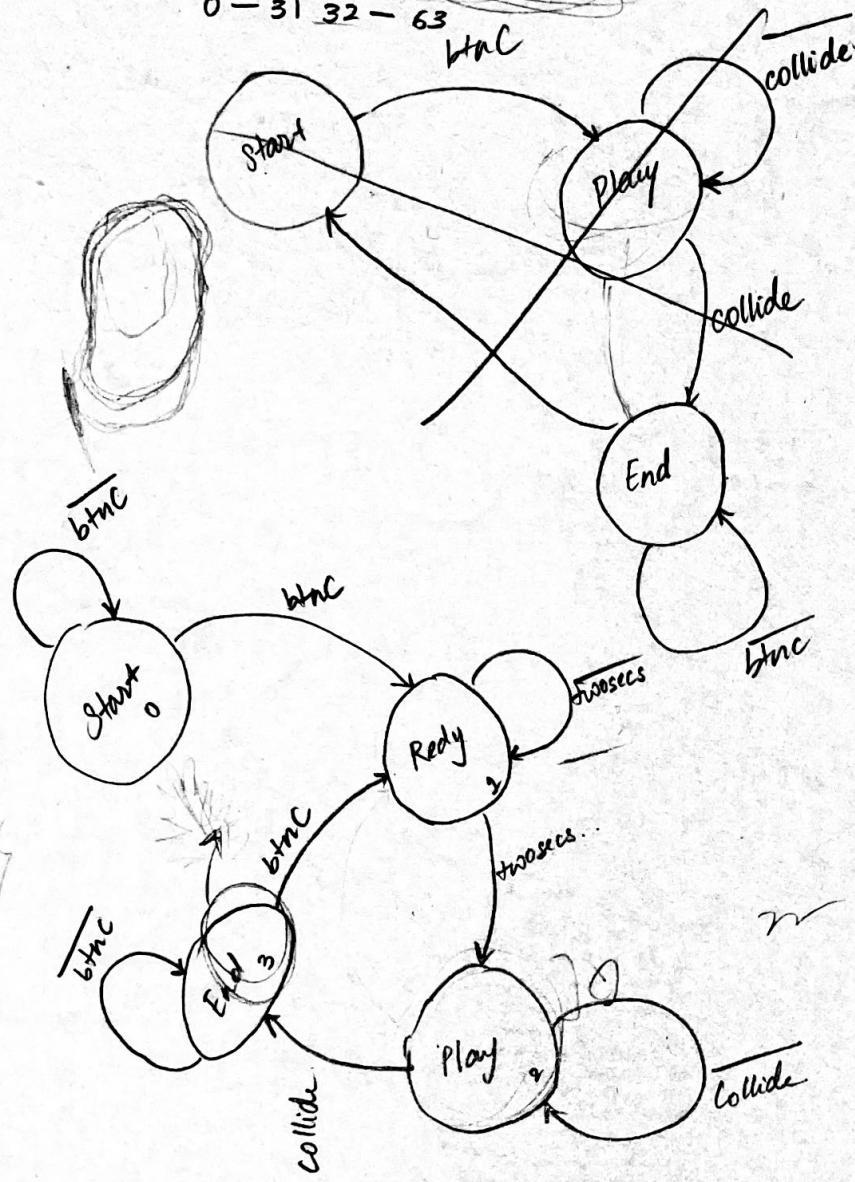
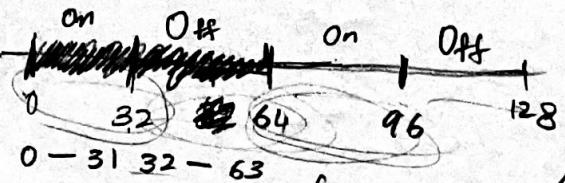
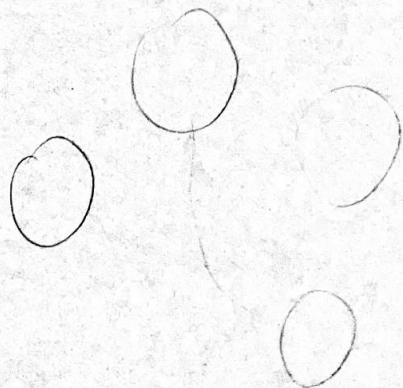
frog - new - state - machine

Lab - 9

3

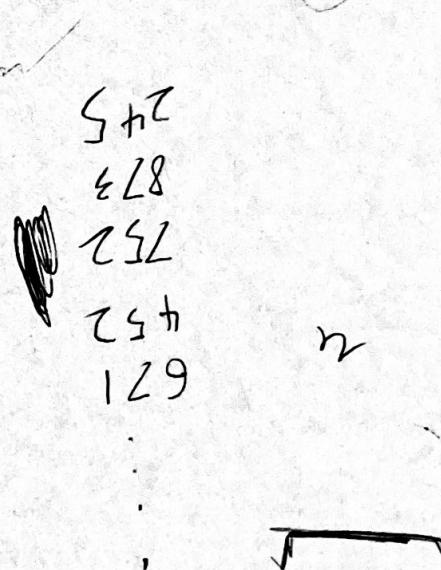
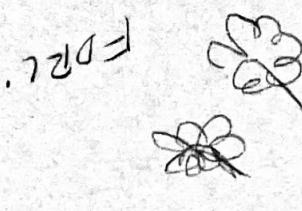


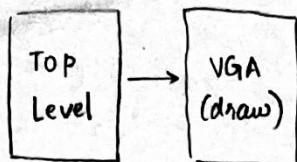
31

40
42 4245
873
252
452
129245
873
252

LFSR

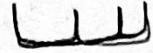
d1





VGA → draws frog.

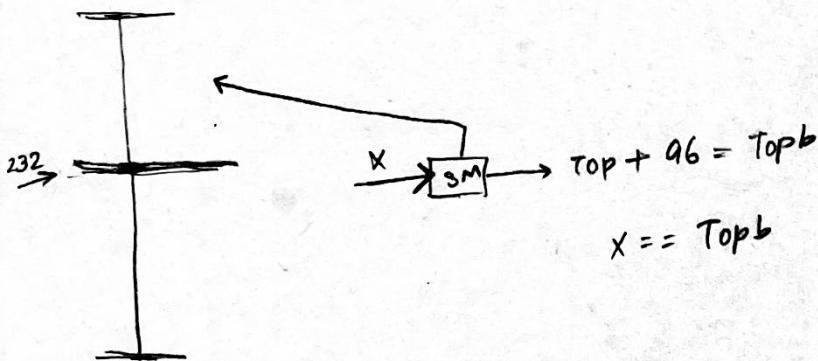
↳ calls frog move.



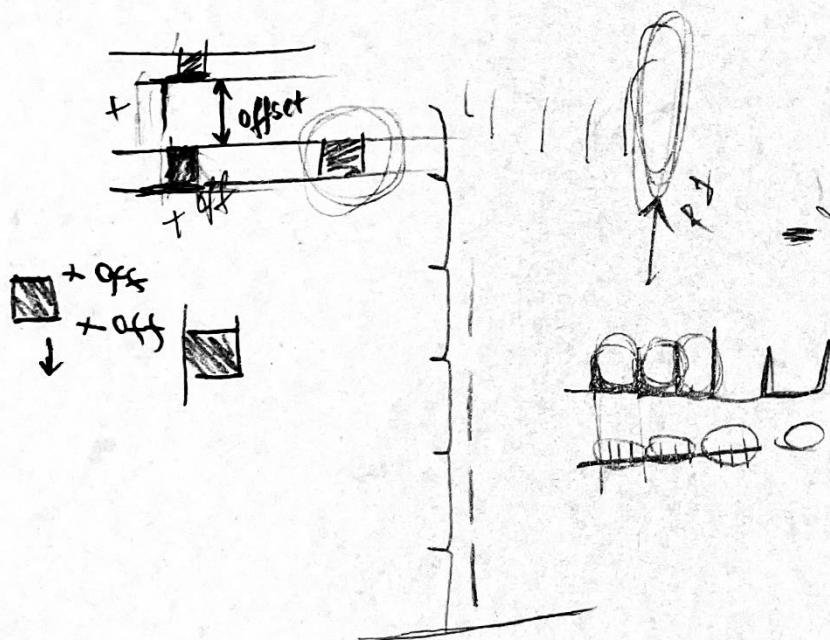
everytime frame goes high calculates offset

add 3

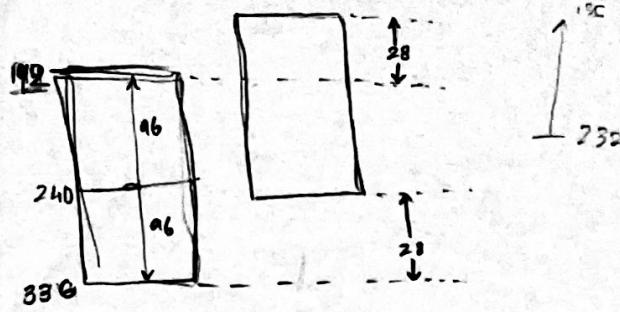
↳ add offset to y and minus offset from low-y



$$\begin{aligned} 0 &= 00 \\ 3 &= 12 \\ 6 &= 1 \end{aligned}$$



Lab - 7 ④ Leaf mechanics.



$-28, -24, -20, -16, -12, -8, -4, 0, 4, 8, 12$
 $16, 20, 24, 28$
 0

001
100

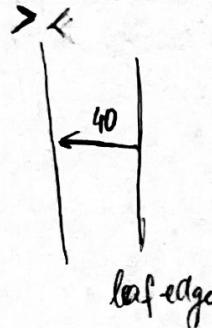
LL

0, 1, 3, 7, e, c, 8, 6, 9, f 5, a, d, b

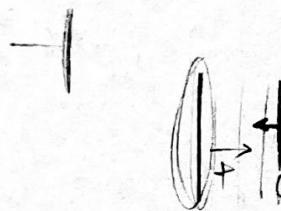
10

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, f

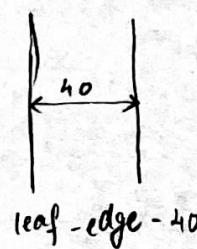
a.



leaf edge



168, 176, 192



leaf-edge-40

2 seconds

128 frames

0-31

inactive

GCFive

32-63

active

TRactive

64-95

inactive

active

96-128

inactive

inactive

128

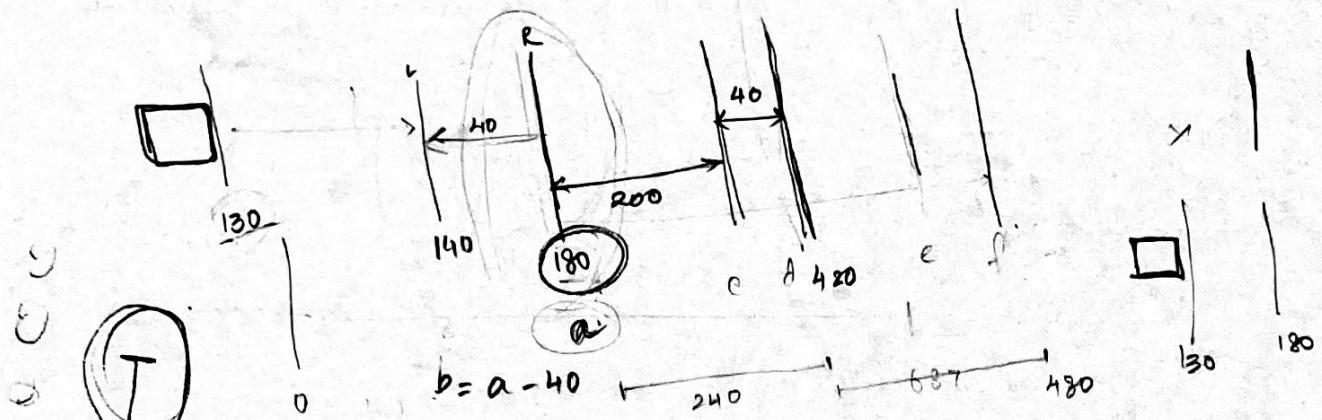
31 >= active

frog active = () / 1.61

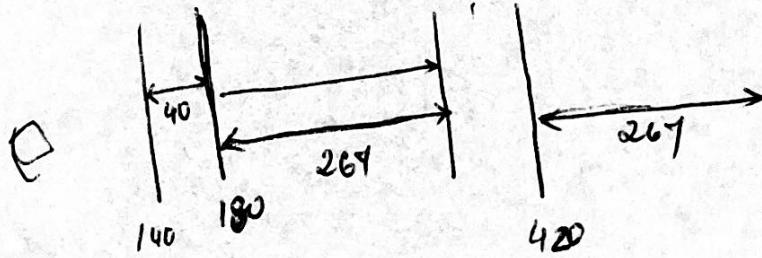
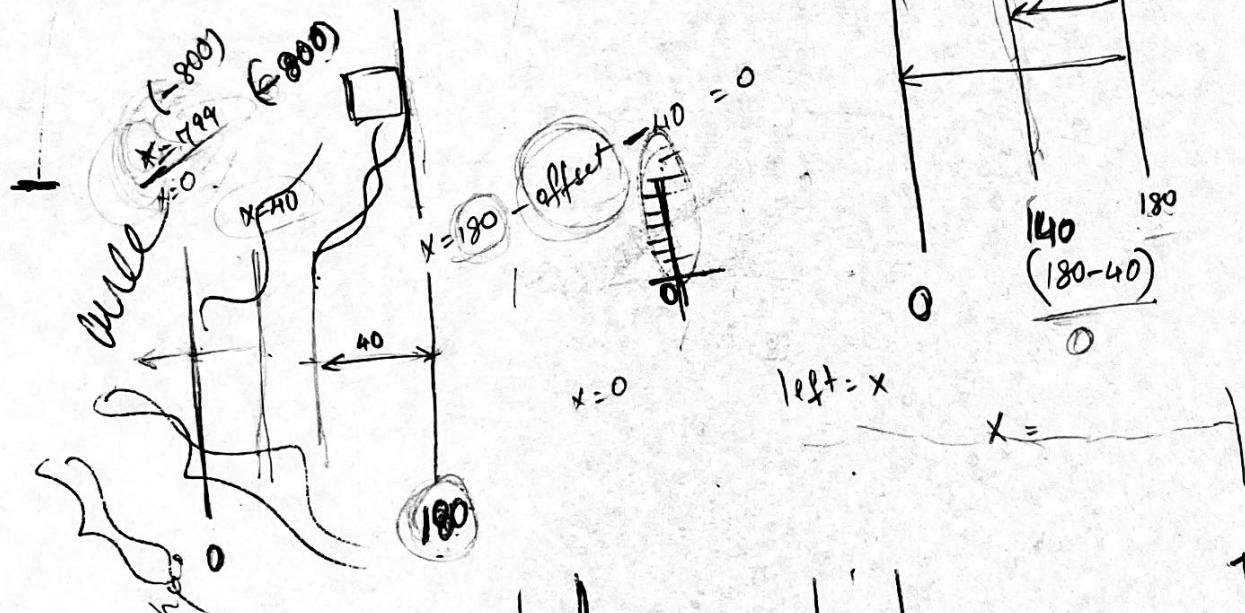
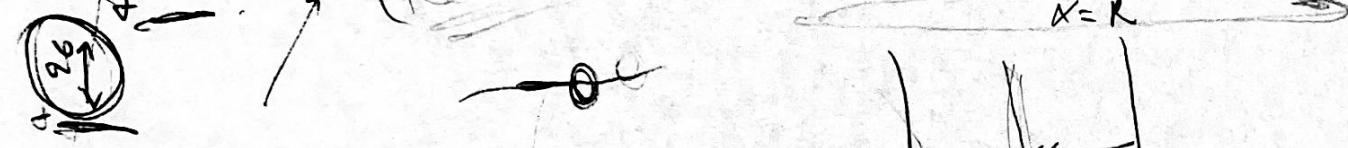
Red (frog-active) / 4'61

leaf mechanics.

1.5



Offset
if $x > \text{left edge}$ | $\text{right edge} < 40$)



799