

# STATECHARTS

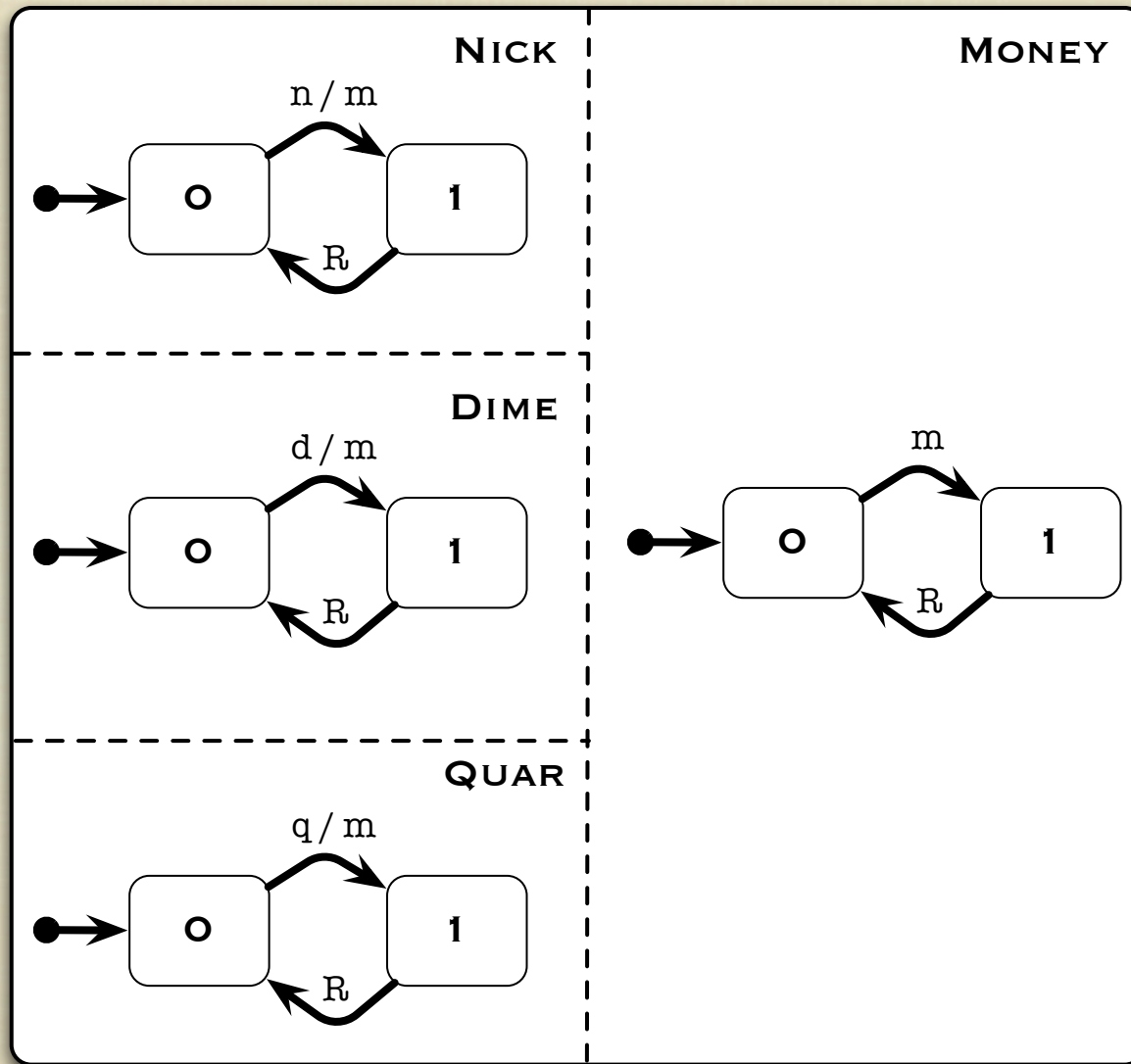
CURT CLIFTON

ROSE-HULMAN INSTITUTE OF TECHNOLOGY

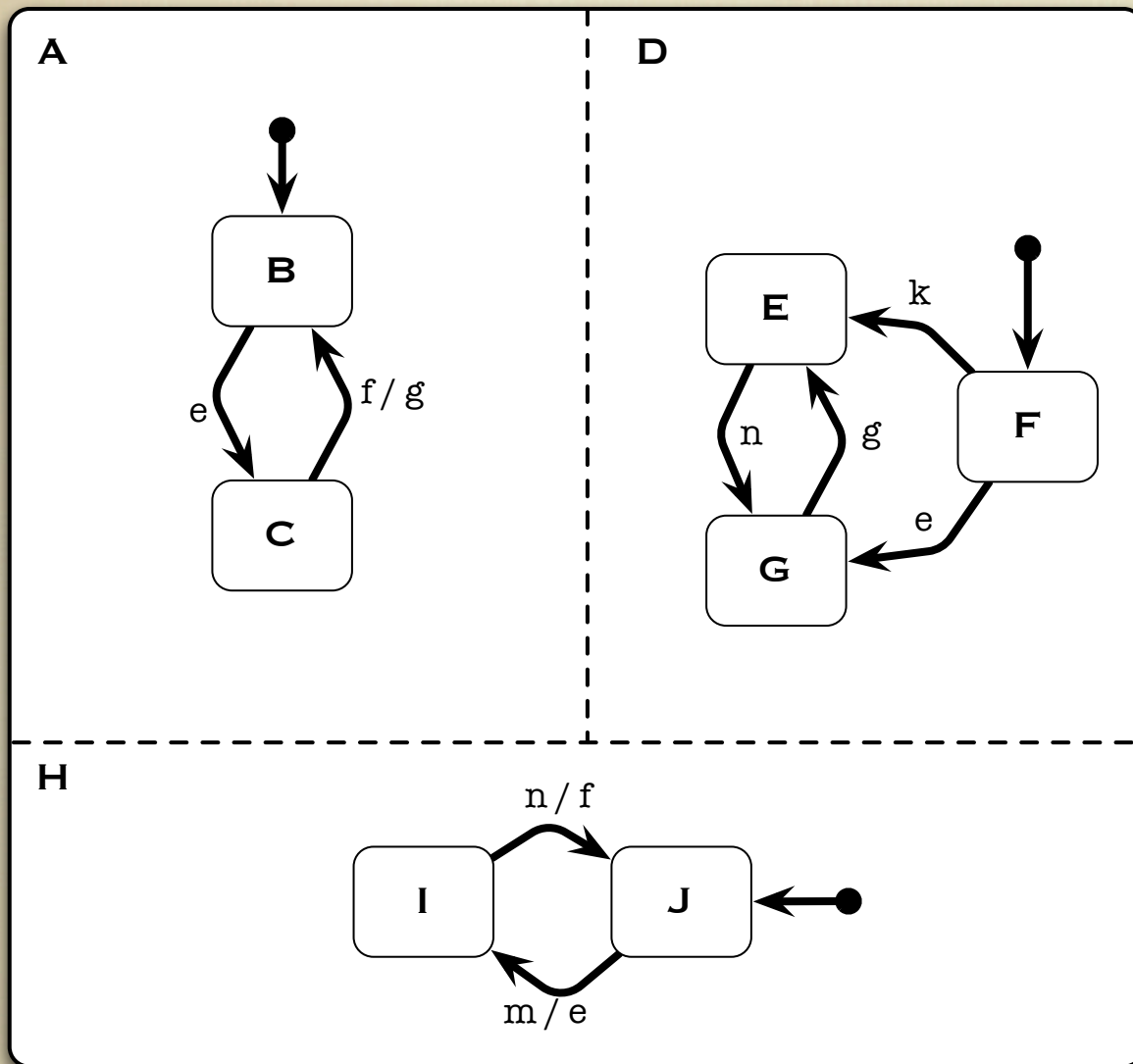
# PROPAGATION

- SUPPOSE A CHANGE IN ONE SUB-STATE SHOULD TRIGGER A CHANGE IN ANOTHER SUB-STATE
- HOW SHOULD WE REPRESENT THIS?

# BROADCAST



# MORE BROADCAST



■ START?

■ EVENT M

■ ...

■ EVENT N

■ ...

■ END?

# CONDITIONS, SUBSTATES

- INPUTS CAN BE “GUARDED” BY CONDITIONS

- SYNTAX:  
input [ condition ] / output

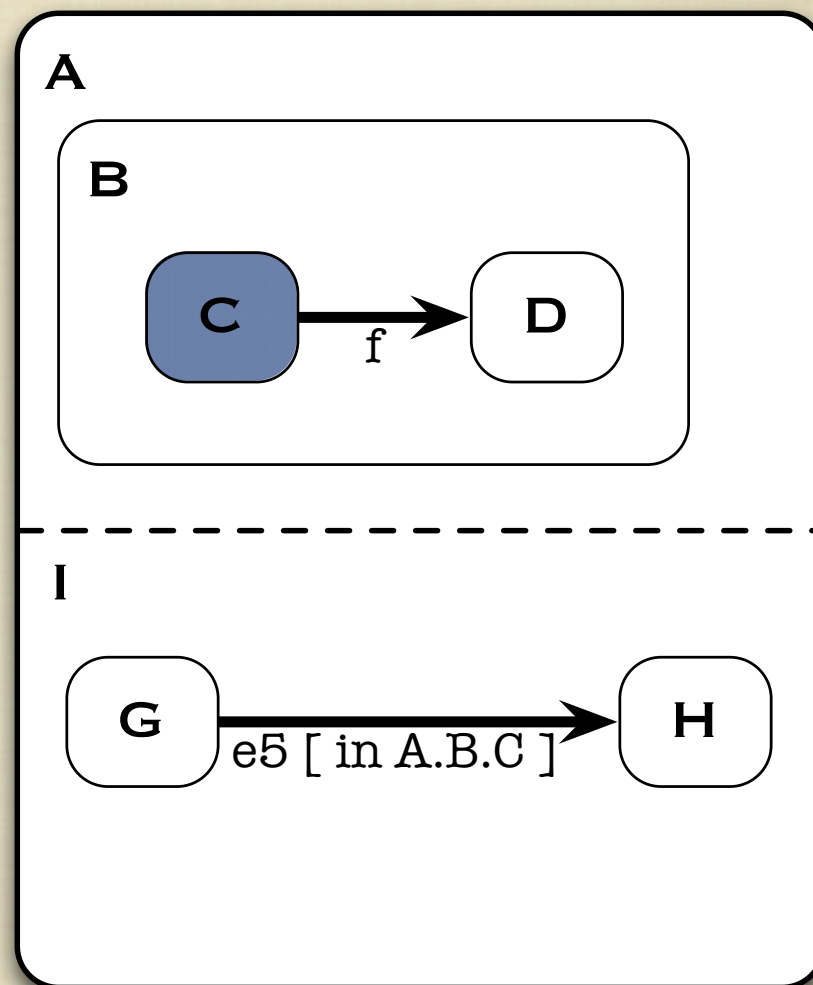
- EXAMPLES

■ foo [ x > y ]

ARBITRARY  
BOOLEAN  
EXPRESSION

■ e5 [ in A.B.C ]

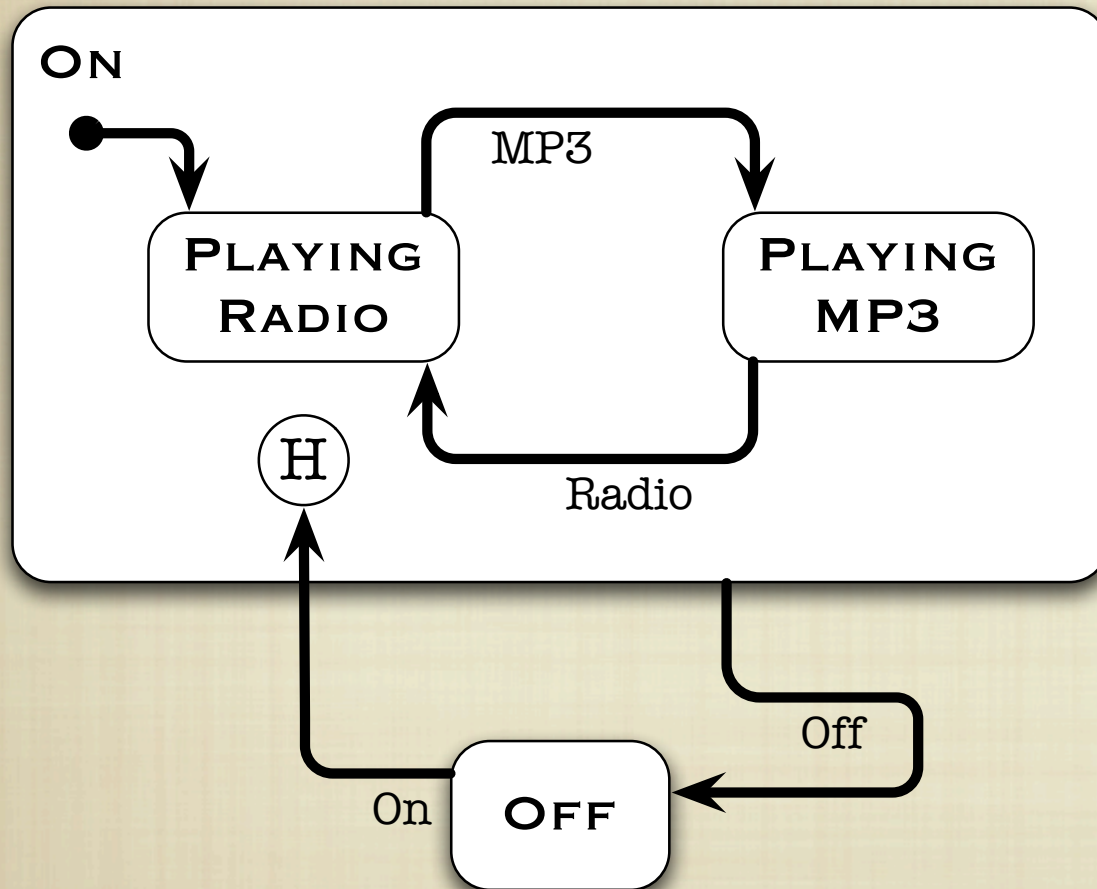
STATE  
CONTAINMENT



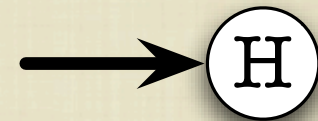


HISTORY

# RECALL: HISTORY

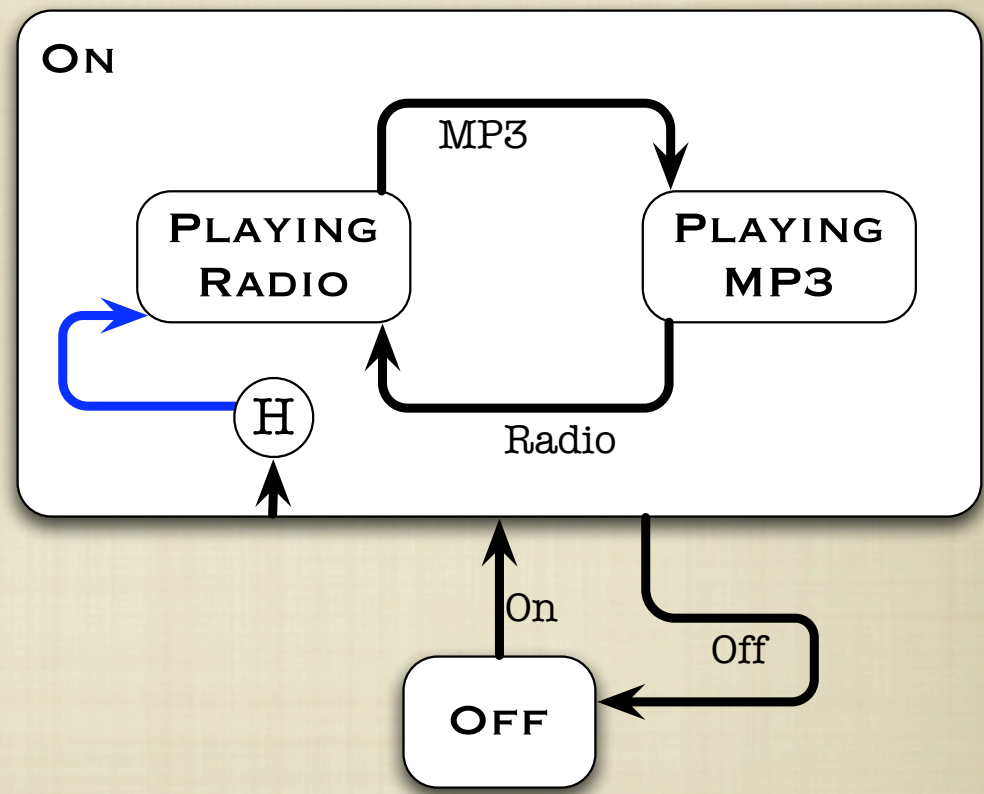
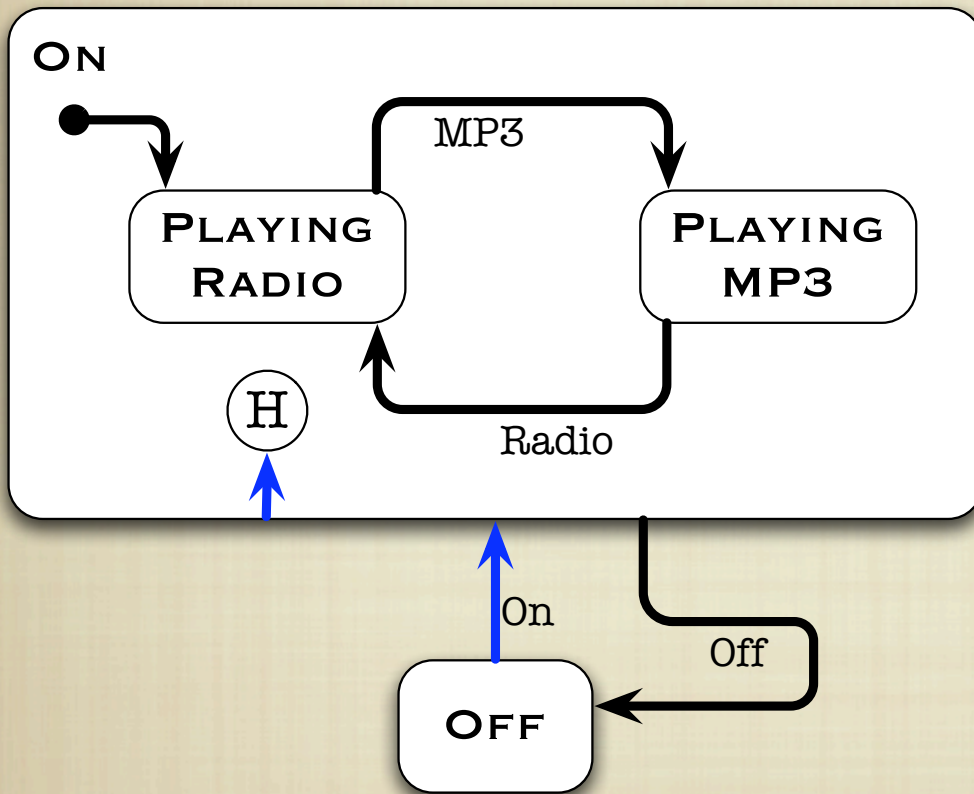


- CAN DENOTE RE-ENTERING LAST SUB-STATE



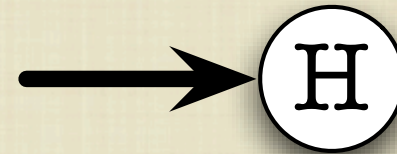
- AN ALTERNATIVE TO DEFAULT INITIAL STATE

# ALTERNATIVE HISTORY NOTATIONS

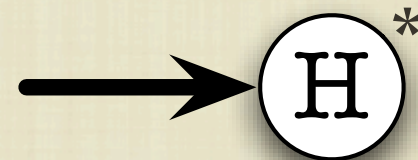


# HISTORY LEVELS

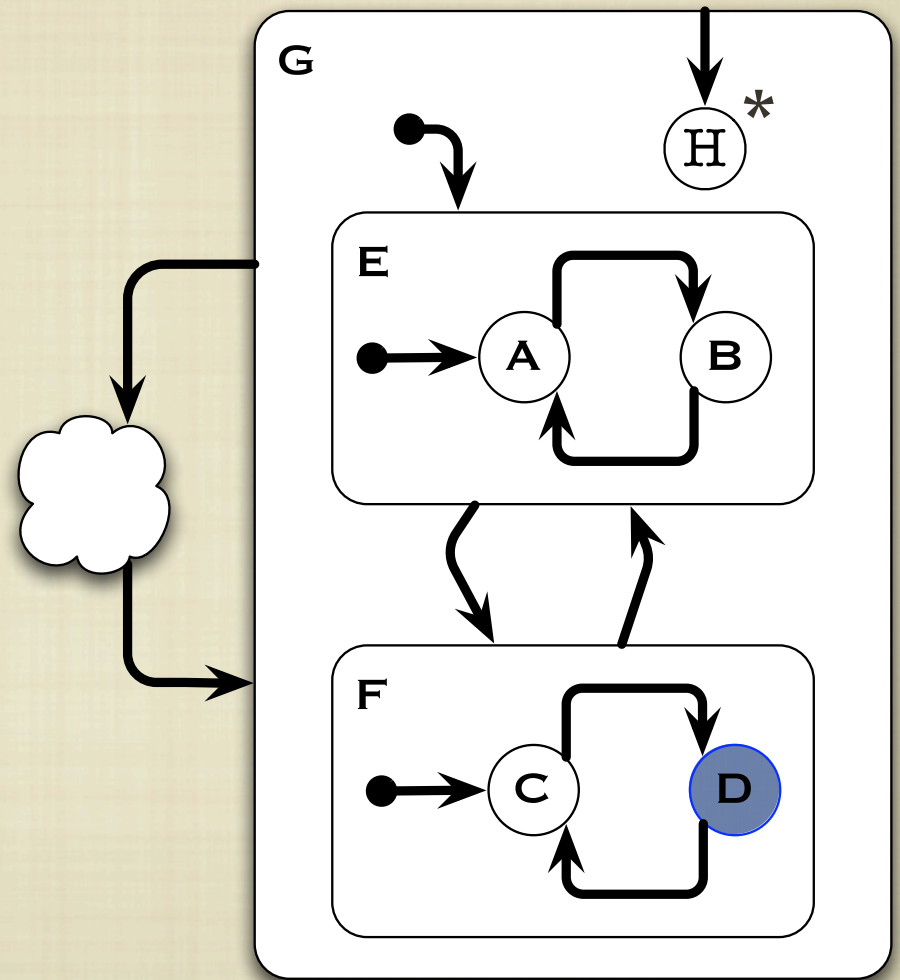
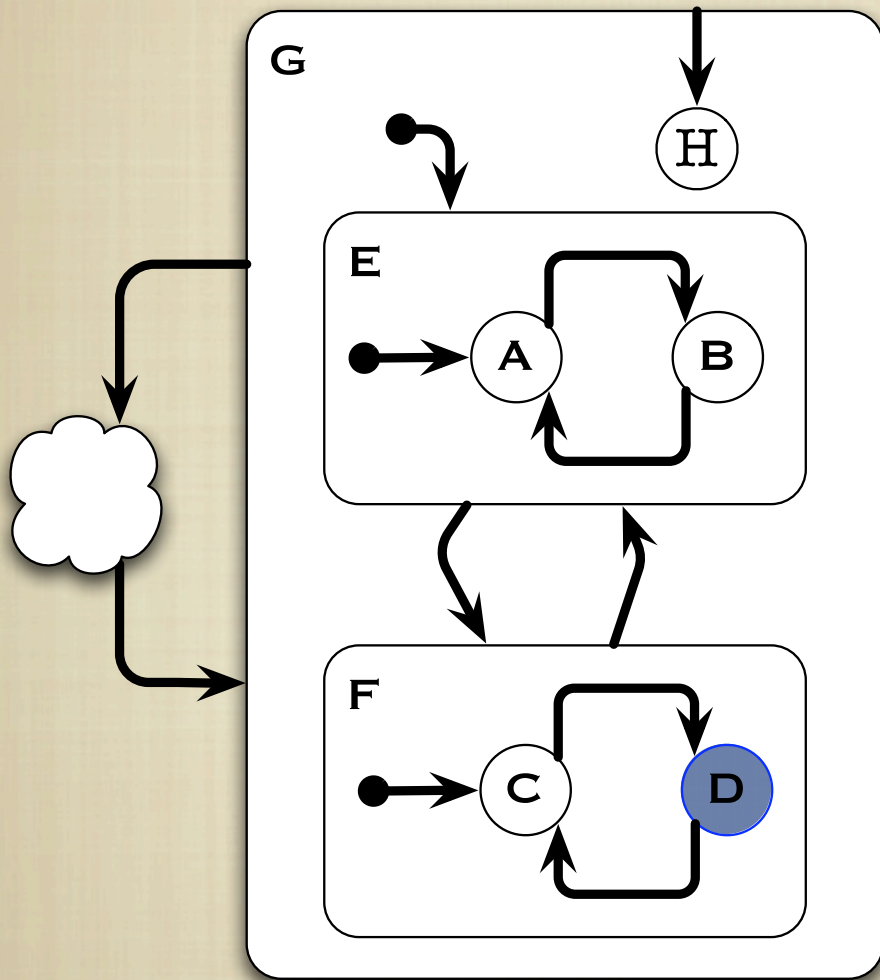
- PLAIN HISTORY SYMBOL  
JUST APPLIES TO CURRENT  
LEVEL



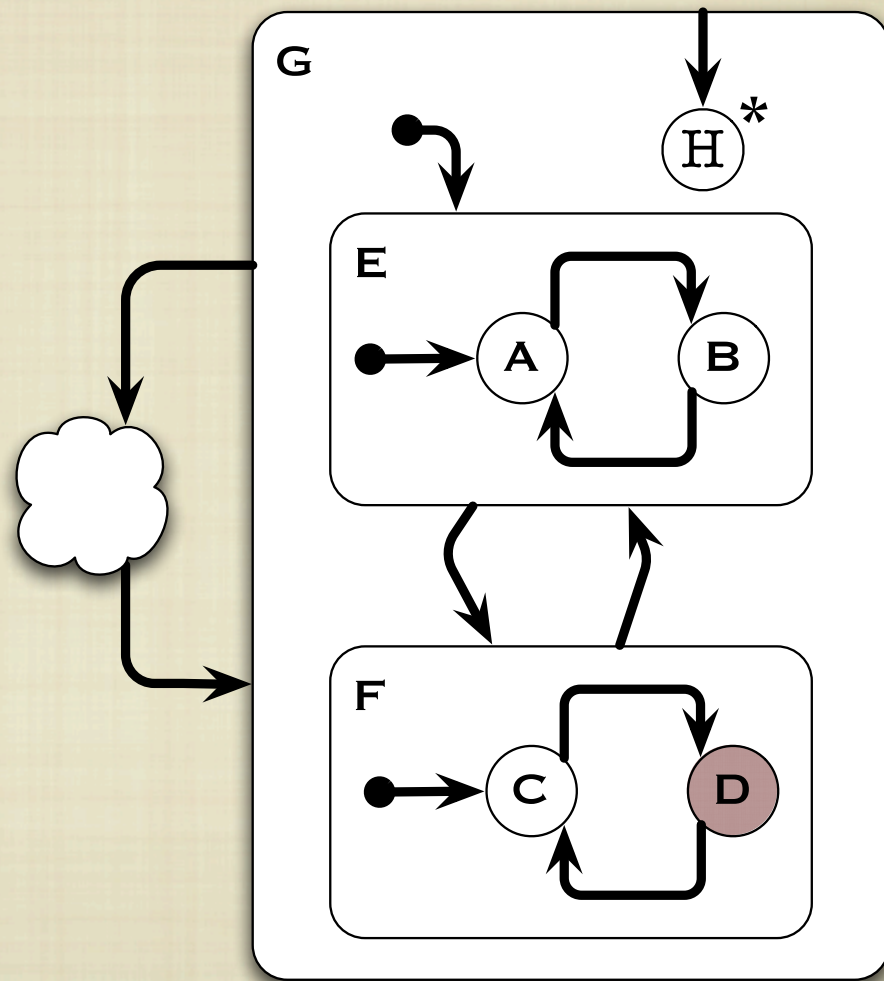
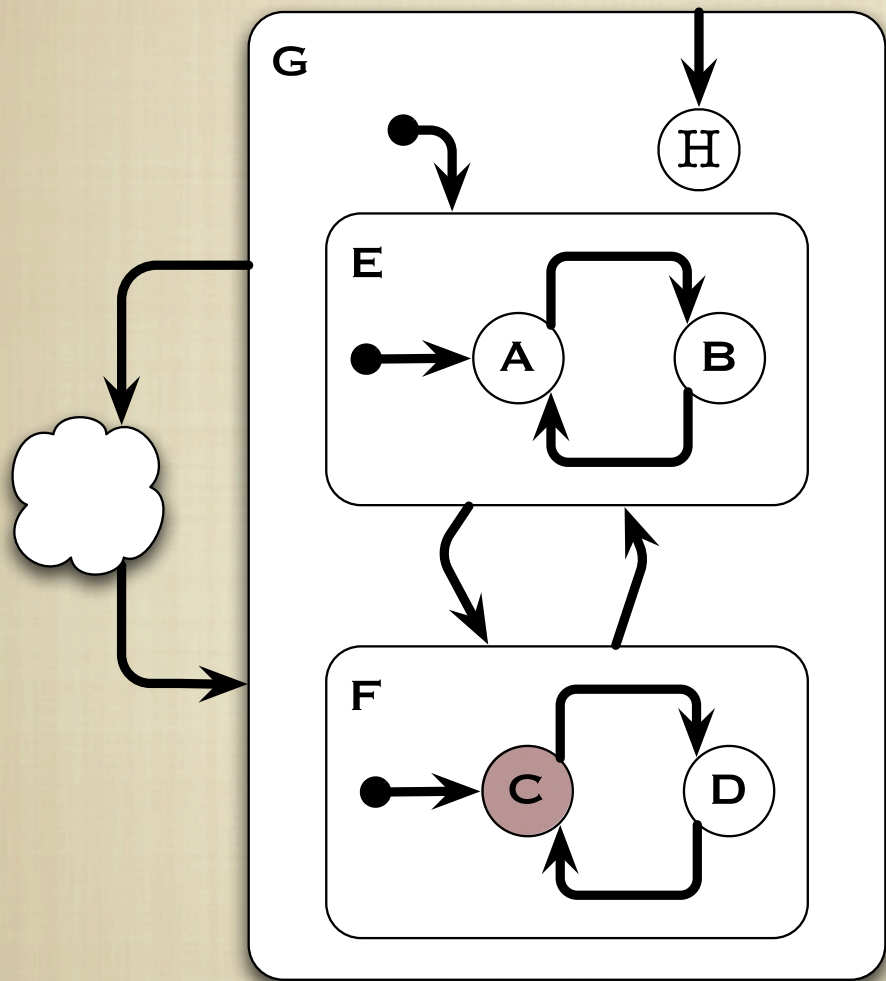
- ADD ASTERISK TO DENOTE  
ALL SUBSTATES



# HISTORY LEVELS EXAMPLE

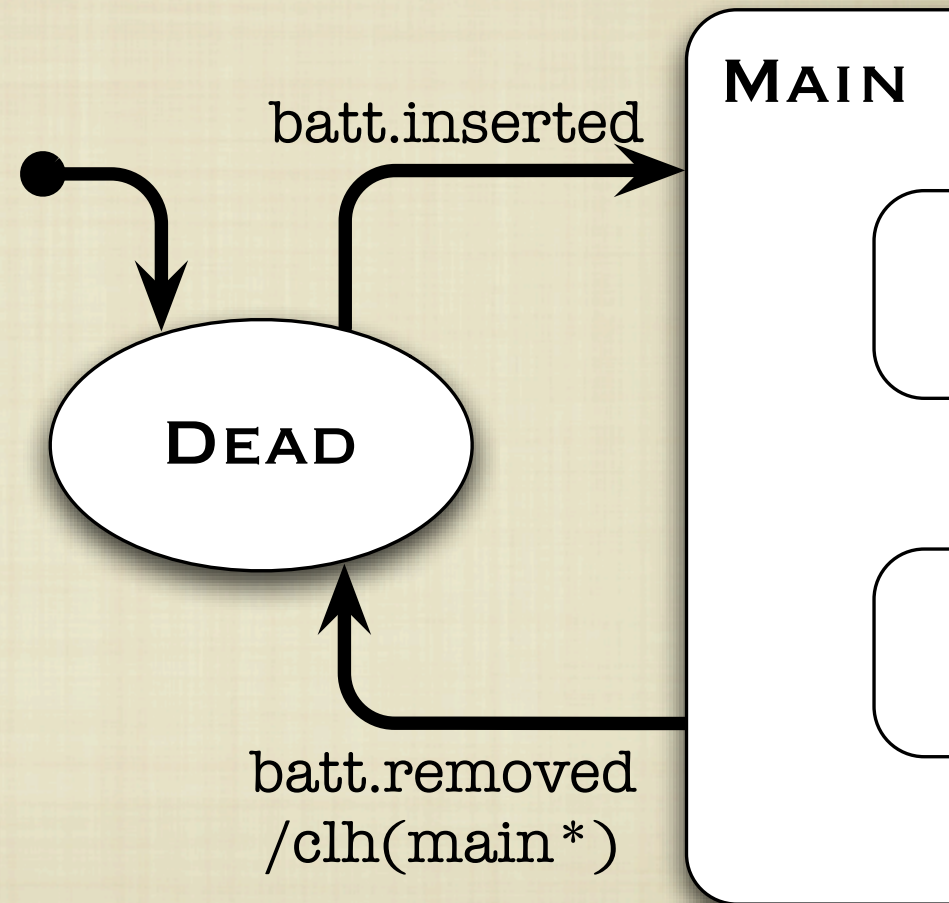


# HISTORY LEVELS EXAMPLE

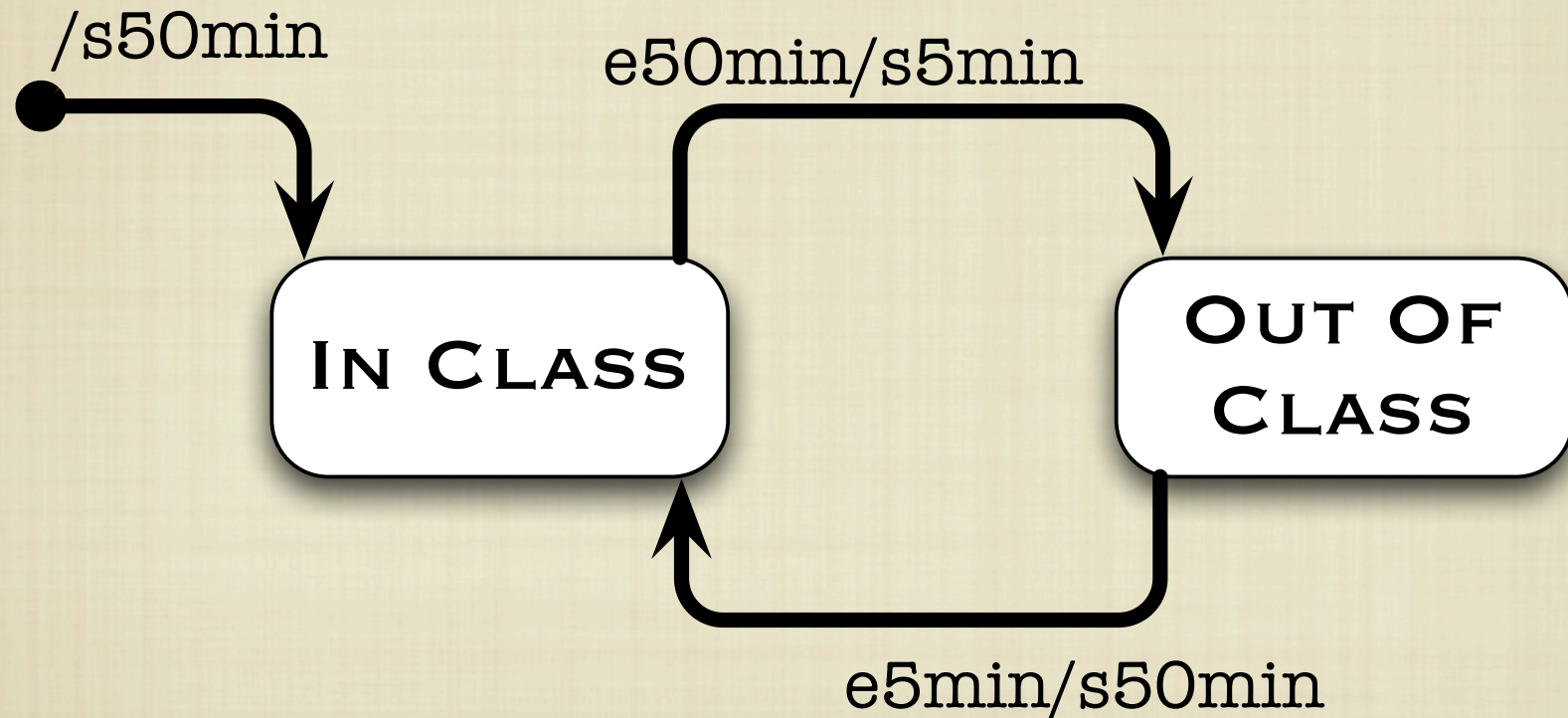


# FORGETTING THE PAST


- SOMETIMES USEFUL TO CLEAR HISTORY
- SYNTAX:  
clear-history(state) OR  
clear-history(state\*)
- ABBREVIATIONS:  
clh(state) OR  
clh(state\*)




USE **s**Time ACTION TO START A TIMER  
AND **e**Time EVENT TO REACT TO TIMER.




THIS LIGHT ALWAYS TAKES FOREVER.  
I'D LIKE TO SMACK THE IDIOT WHO DESIGNED THIS INTERSECTION.




HI.  
WHO THE HELL ARE YOU?  
I DESIGNED THIS INTERSECTION.




YOU'RE RIGHT- I SHOULD HAVE JUST MADE THE LIGHT SHORTER! NEVER MIND THE HOURS OF SIMULATION AND TESTING I DID. NEVER MIND THAT THIS INTERSECTION INTERACTS WITH ITS NEIGHBORS IN A COMPLICATED WAY AND IT TOOK ME A WEEK TO WORK OUT TIMING SEQUENCES THAT AVOIDED TOTAL JAMS.



CLEARLY, I'M A CRAPPY ENGINEER AND YOU HAVE A BETTER SOLUTION.  
GO ON, SHOW ME YOUR PROPOSED TIMINGS.



GET THE HELL OFF MY HOOD BEFORE I START DRIVING AND FLING YOU INTO TRAFFIC.



YOU CAN'T. LIGHT'S RED.  
WELL, WHEN WILL IT CHANGE?  
TUESDAY.



**YOU CAN LOOK AT PRACTICALLY ANYTHING MANMADE AROUND YOU AND THINK 'SOME ENGINEER WAS FRUSTRATED WHILE DESIGNING THIS.' IT'S A LITTLE HUMAN CONNECTION.**

# CARTOON OF THE DAY

WORK ON QUIZ

[HTTP://XKCD.COM/277/](http://xkcd.com/277/)