

STATE DIAGRAMS

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STATE DIAGRAMS

- THE BASIS FOR STATE CHARTS
 - STATE CHARTS ARE “HIGHER-ORDER” STATE DIAGRAMS
- USEFUL FOR MODELING “REACTIVE SYSTEMS”
 - MAINTAIN ONGOING INTERACTION WITH THEIR ENVIRONMENT
 - RATHER THAN PRODUCING SOME FINAL VALUE

A REACTIVE SYSTEM

DO YOU HAVE ANY THOUGHTS REGARDING THE PARTICLE ACCELERATOR'S TERTIARY F.E.L. GUIDANCE SYSTEM?

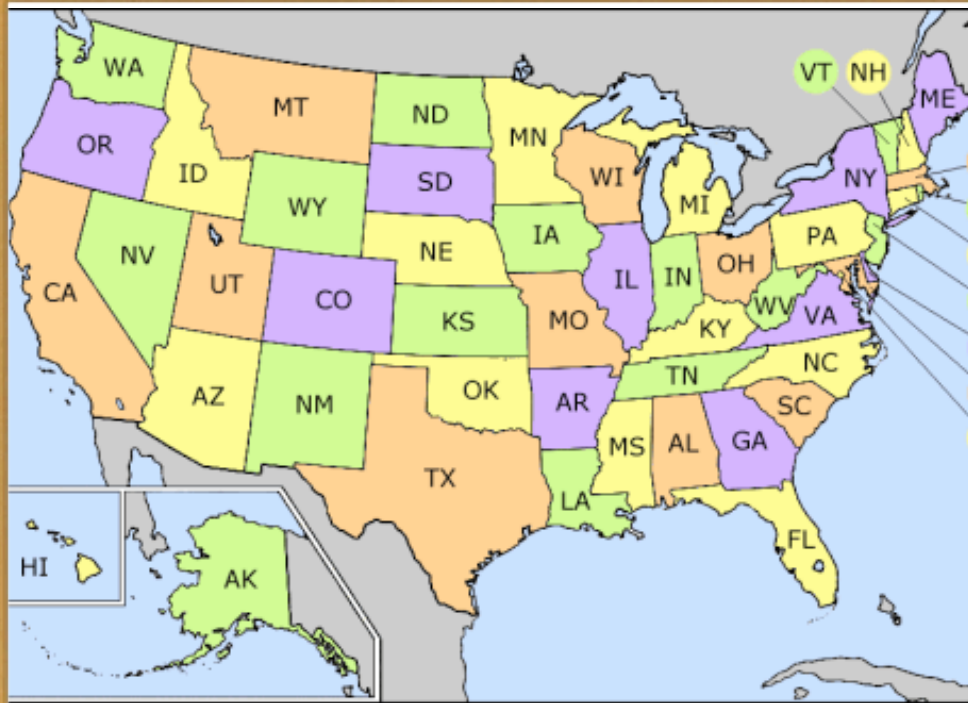
WE CAN'T PUT THE BROKEN PART IN THE MACHINE. IT WOULDN'T SMASH THE RIGHT TINY THINGS TOGETHER. THEN THE MACHINE MIGHT BREAK.

THAT WOULD BE VERY BAD.



I SPENT ALL NIGHT READING SIMPLE.WIKIPEDIA.ORG, AND NOW I CAN'T STOP TALKING LIKE THIS.

ACTUALLY, I THINK IF ALL HIGHER MATH PROFESSORS HAD TO WRITE FOR THE SIMPLE ENGLISH WIKIPEDIA FOR A YEAR, WE'D BE IN MUCH BETTER SHAPE ACADEMICALLY.



STATE DIAGRAM BASICS

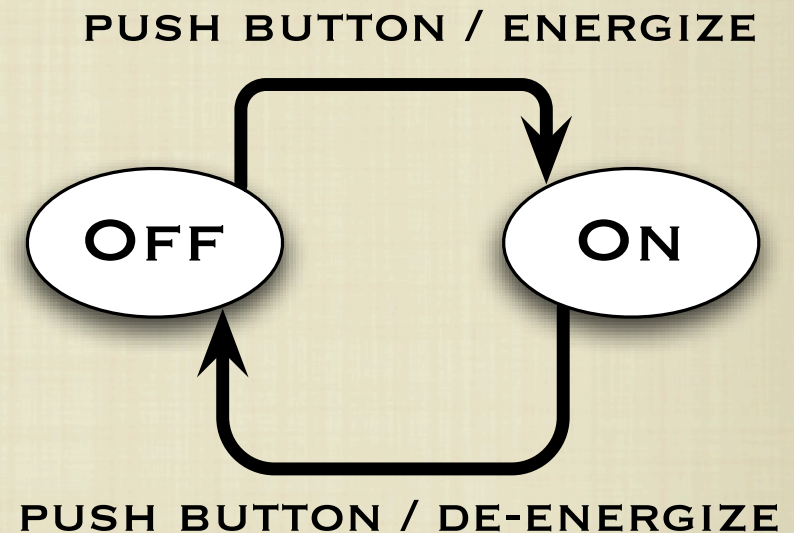
STATE

■ LABELED OVALS



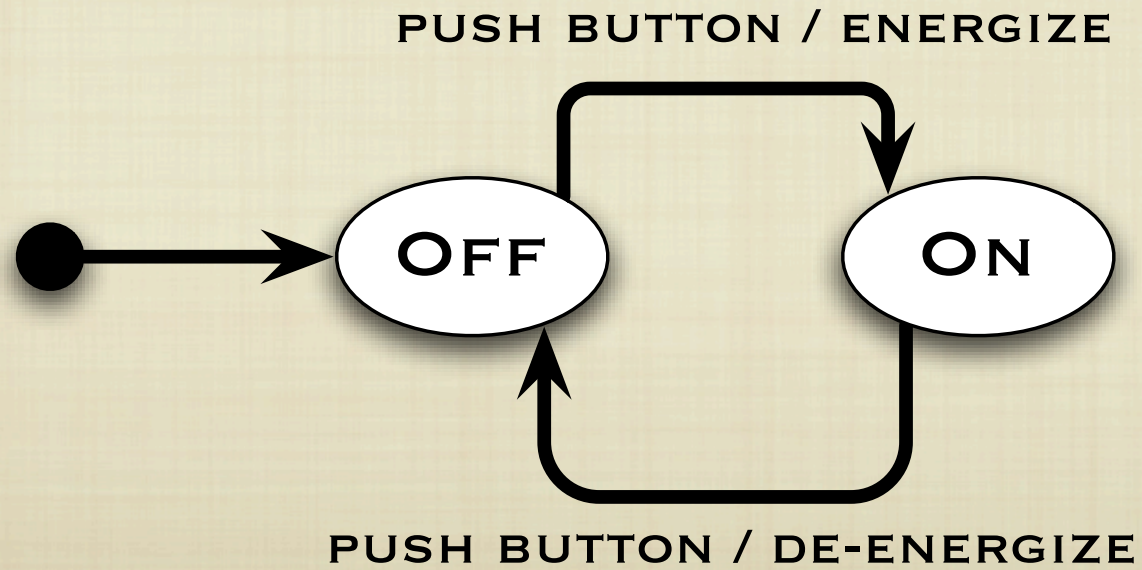
TRANSITIONS

- LABELED ARROWS
- TRIGGER (INPUT)
- ACTION (OUTPUT)
- WRITTEN:
 - INPUT / OUTPUT



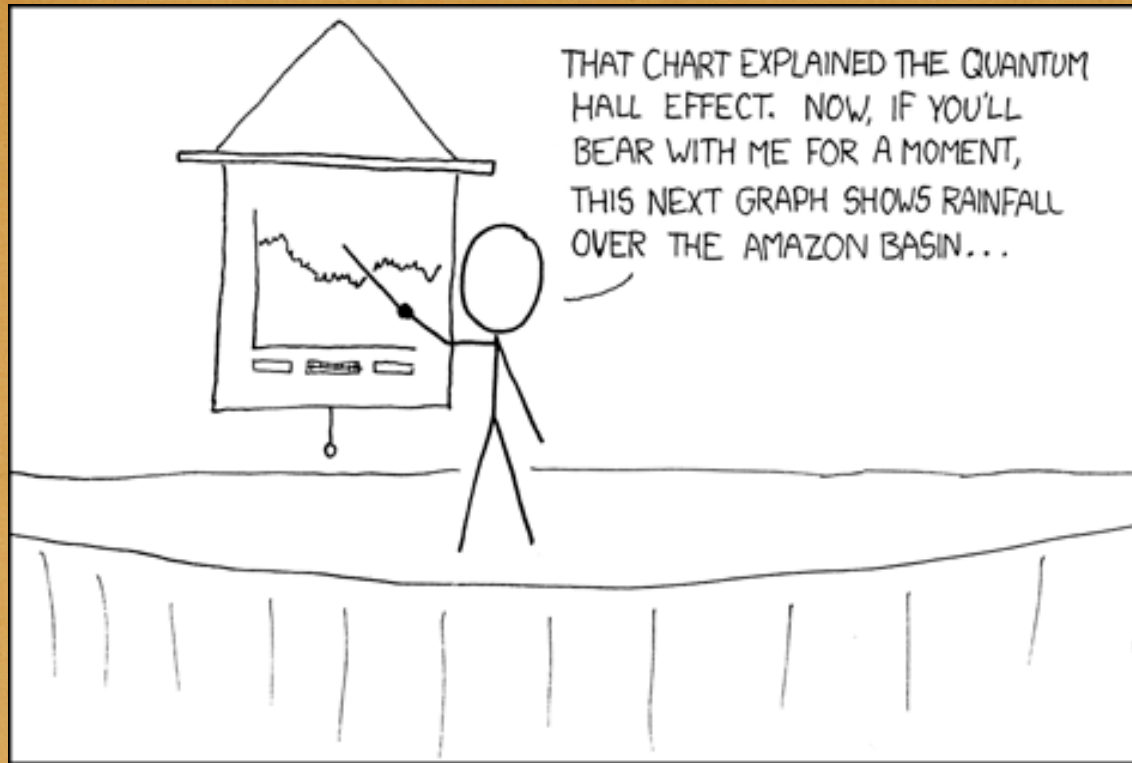
INITIAL STATE

- INDICATED BY ARROW WITH DOTTED TAIL
- (SOMETIMES NO TAIL)



EXAMPLE

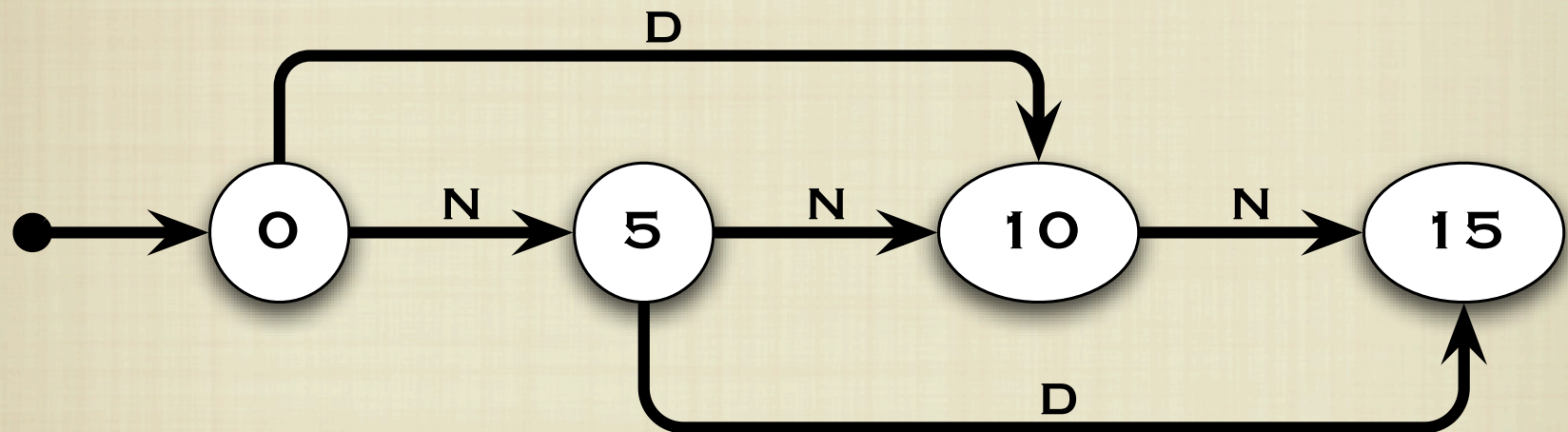
- ELEVATOR WITH STOPS ON THREE FLOORS



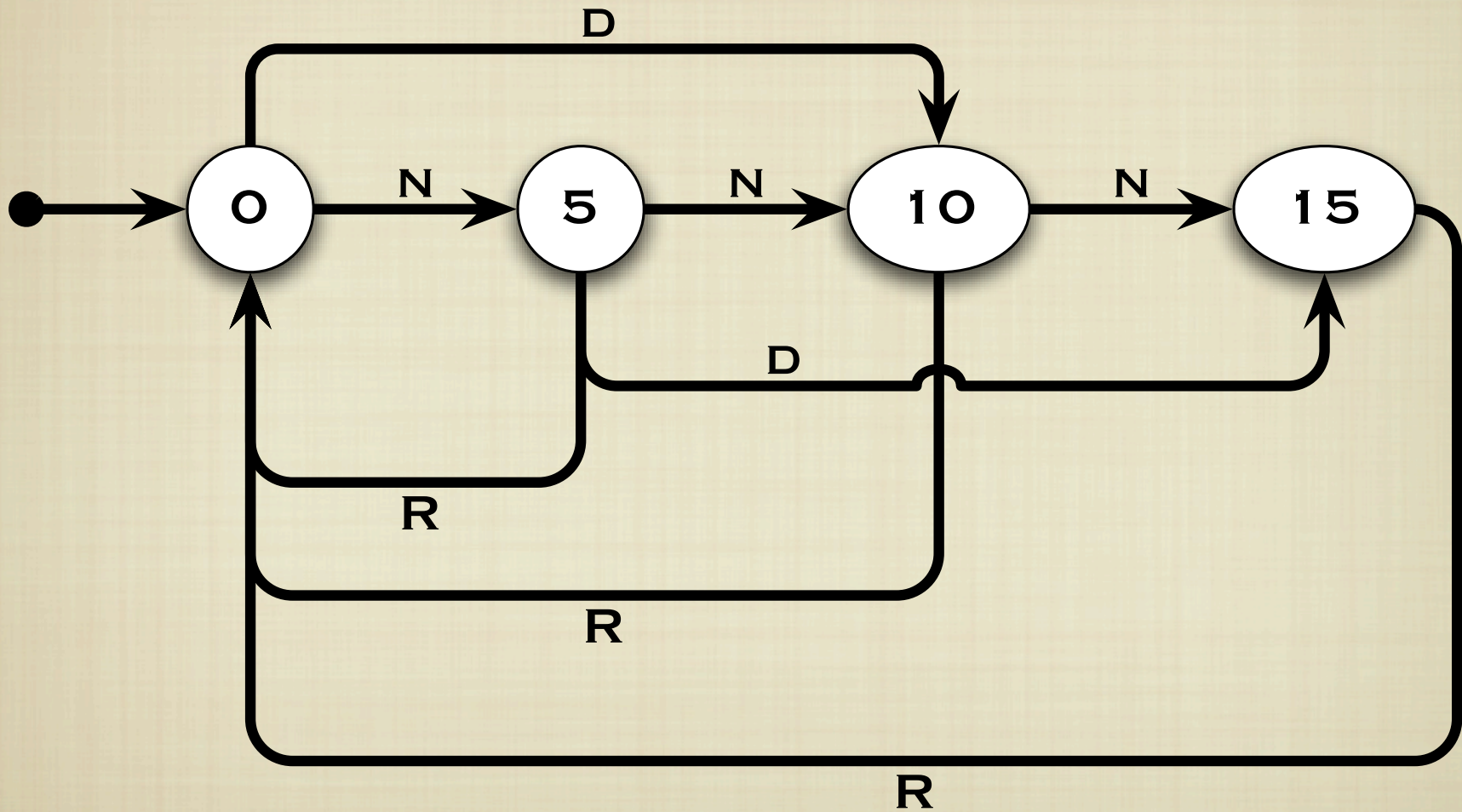
IF YOU KEEP SAYING "BEAR WITH ME FOR A MOMENT", PEOPLE TAKE A WHILE TO FIGURE OUT THAT YOU'RE JUST SHOWING THEM RANDOM SLIDES.

STATE CHARTS

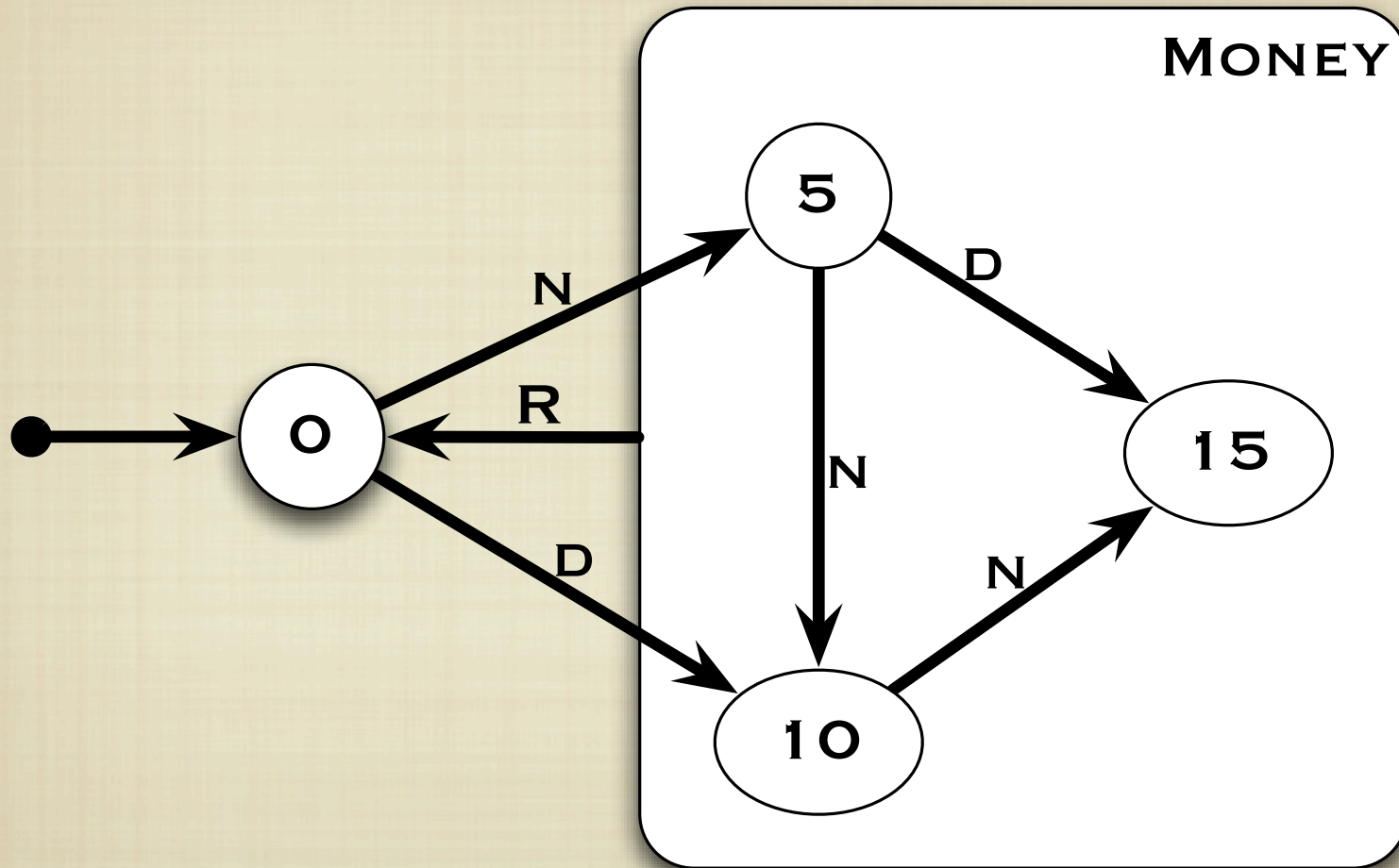
EXAMPLE



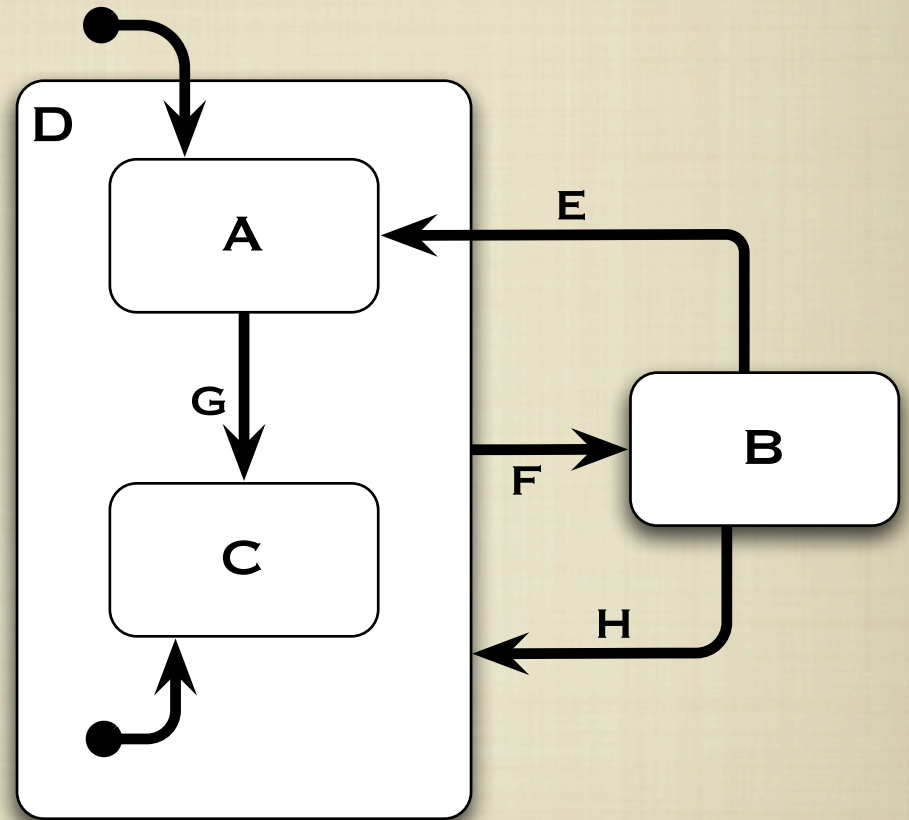
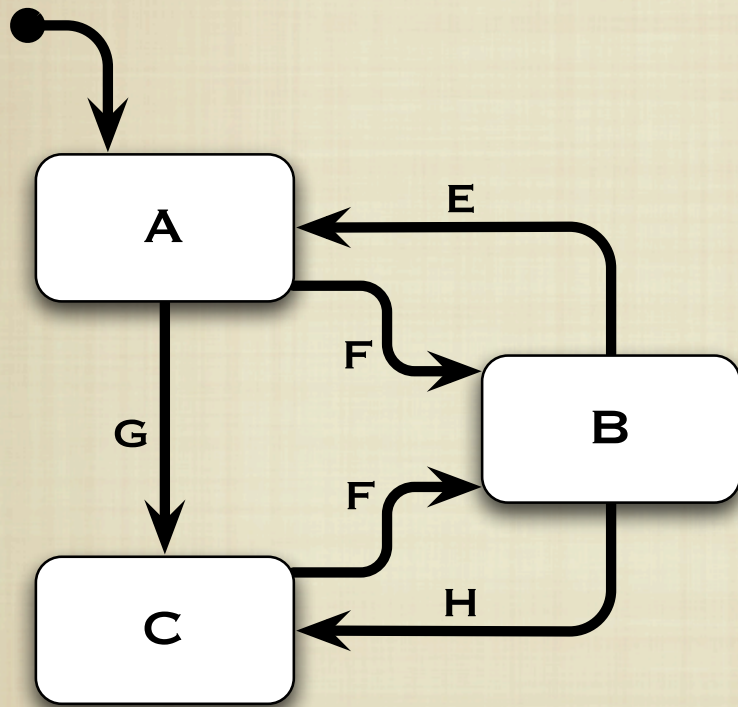
TOO MANY EDGES!



SOLUTION: DEPTH

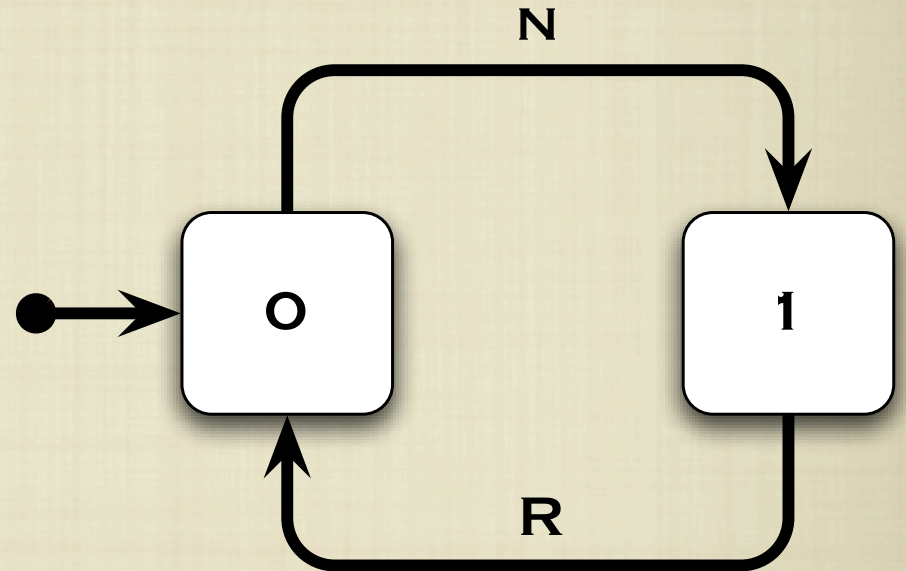


MORE DEPTH

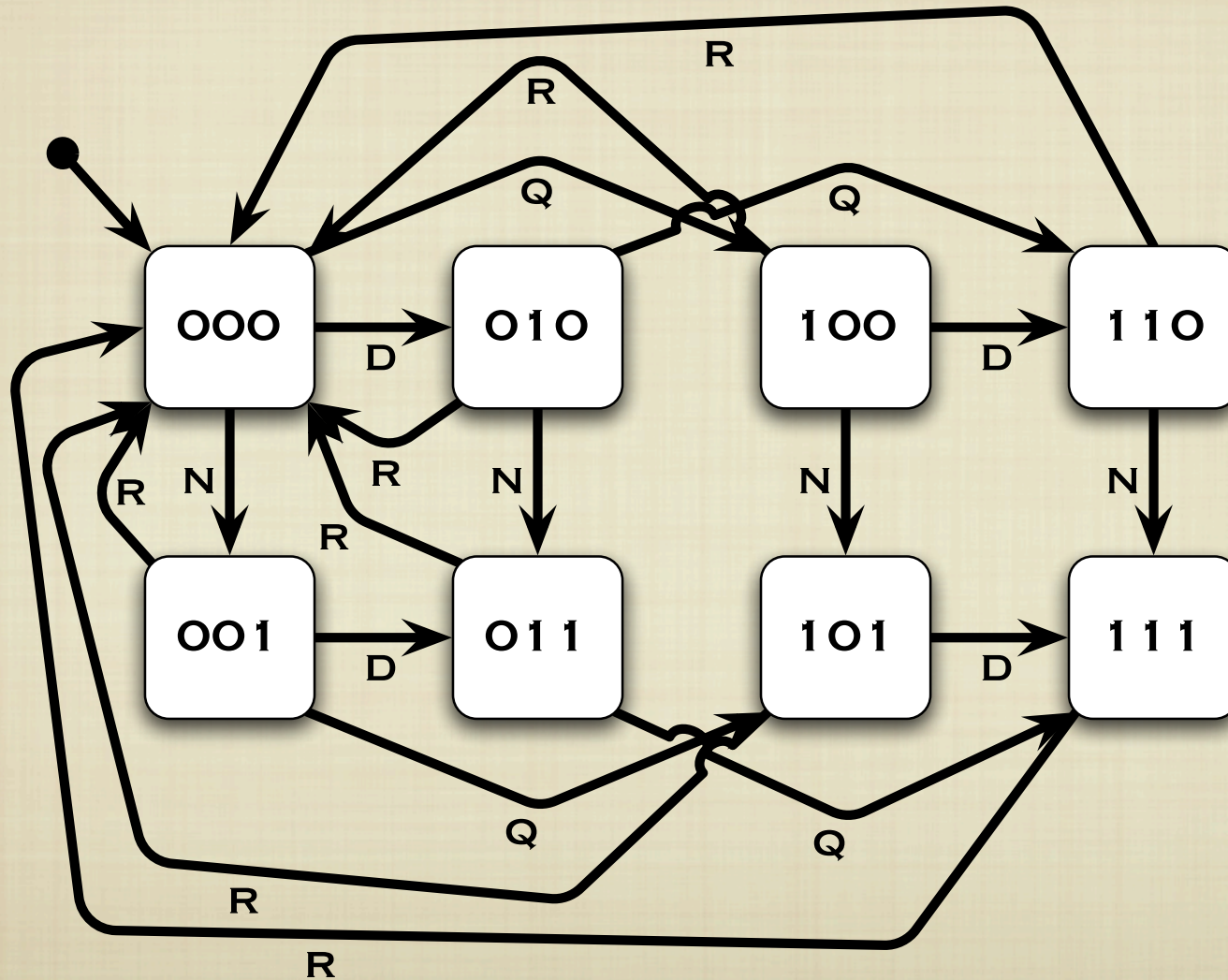


COUNTING COINS

- INSTEAD OF TOTAL, WE WANT TO COUNT COINS
- NICKELS, DIMES, AND QUARTERS
- SIMPLE FOR ONE KIND OF COIN



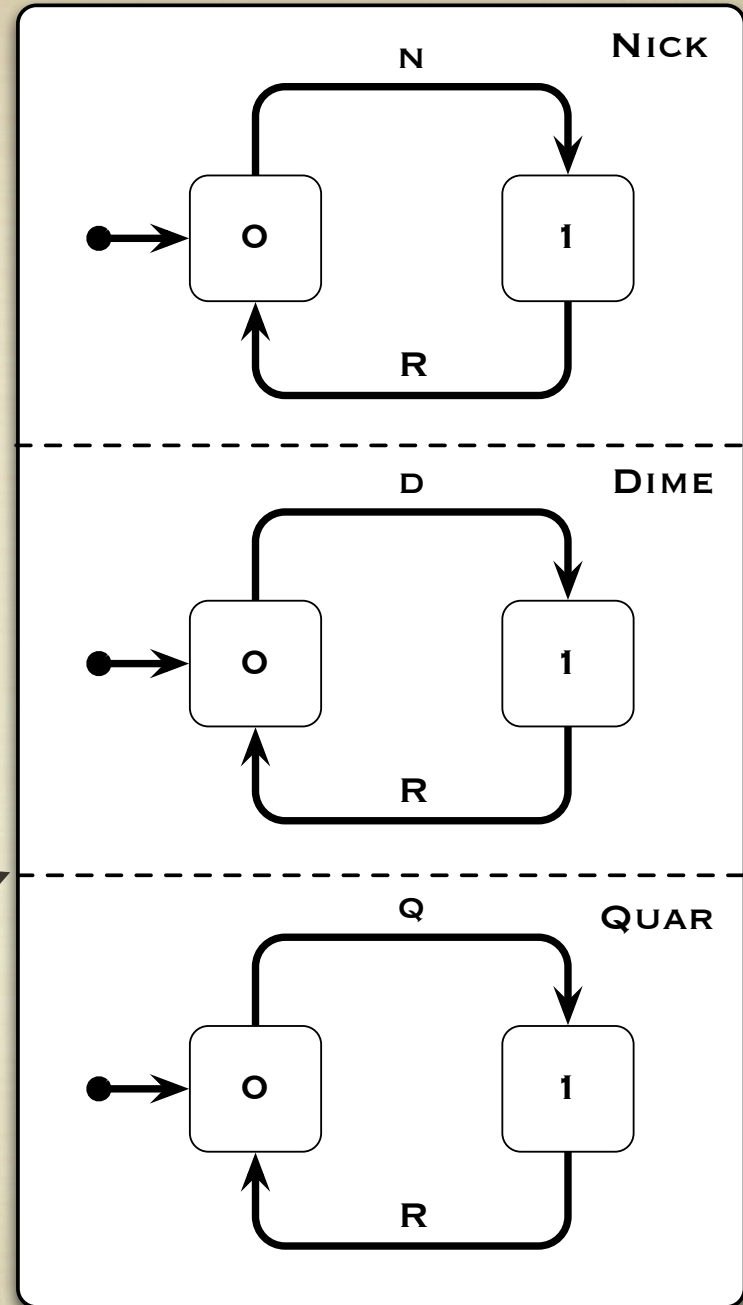

CROSS-PRODUCT EXPLOSION!



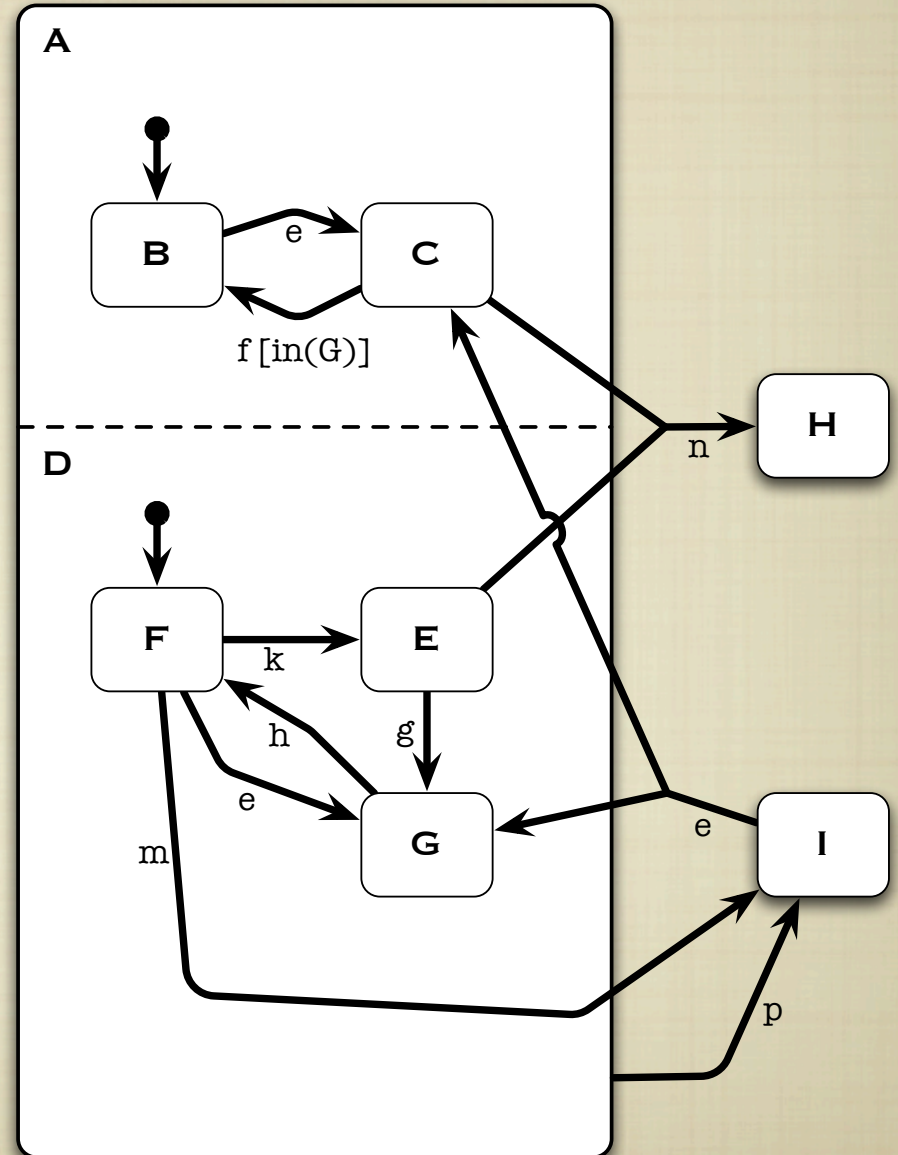
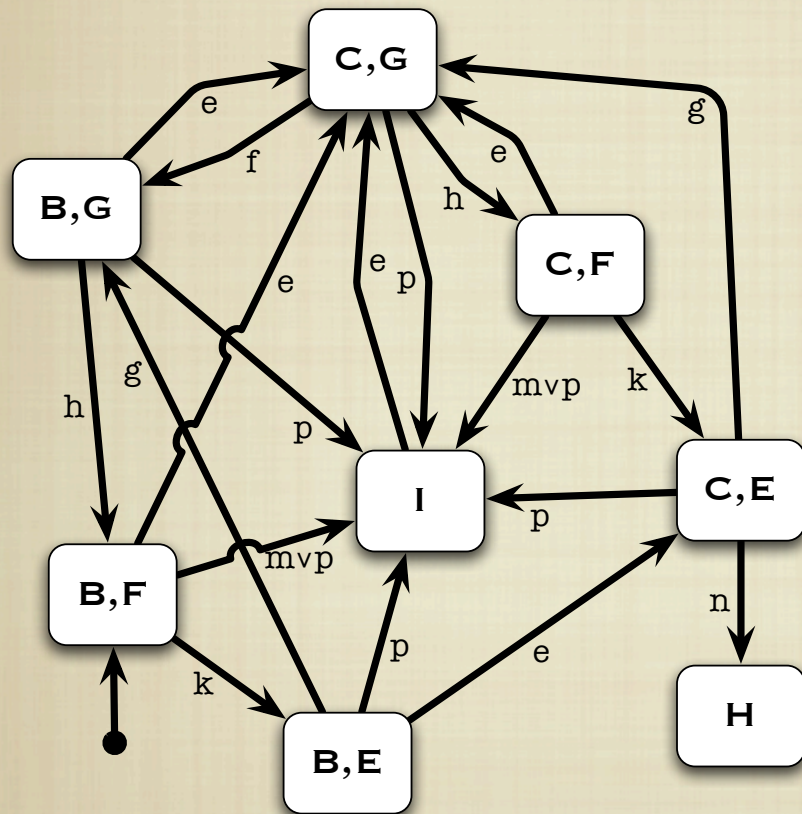
SOLUTION

- ORTHOGONALITY
- STATES IN PARALLEL
- COMMON EVENTS ARE SIMULTANEOUS

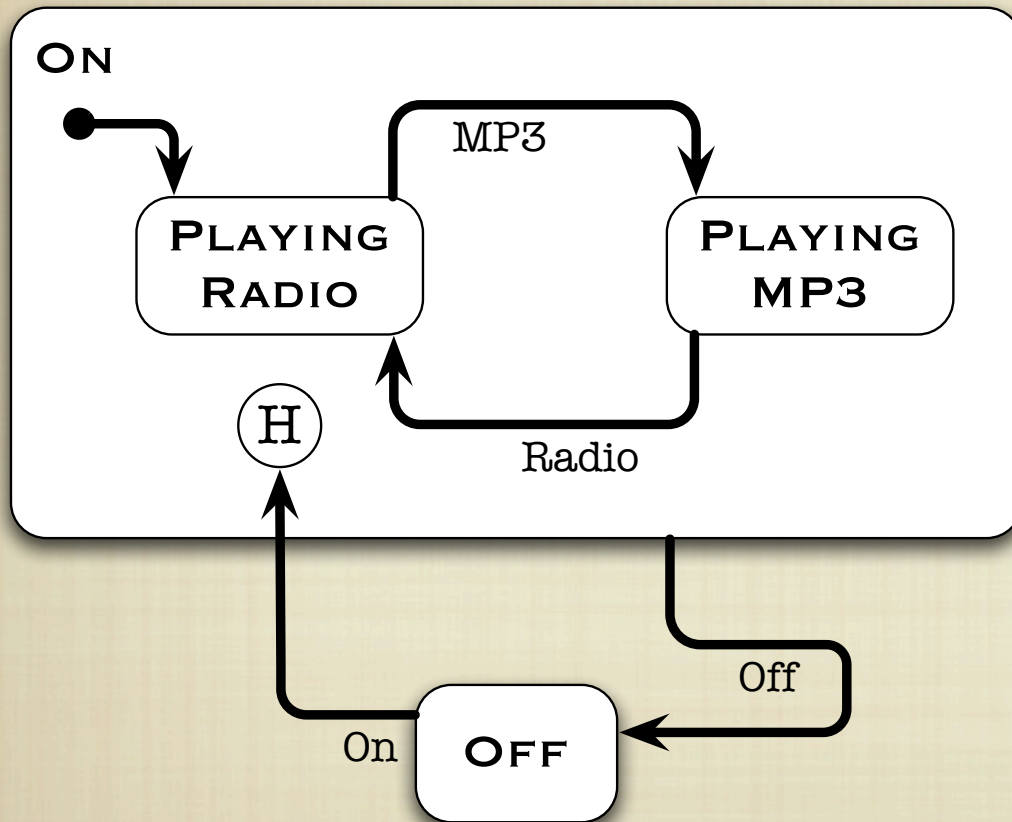
DOTTED LINES
SEPARATE
ORTHOGONAL
SUBSTATES



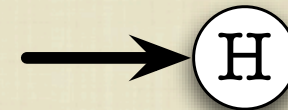
MORE ORTHOGONALITY



HISTORY



- CAN DENOTE RE-ENTERING LAST SUB-STATE



- AN ALTERNATIVE TO DEFAULT INITIAL STATE