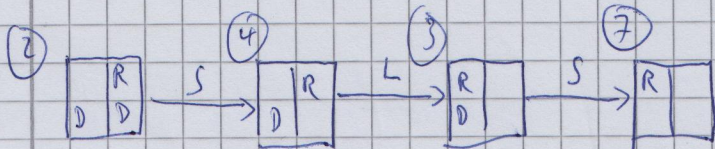
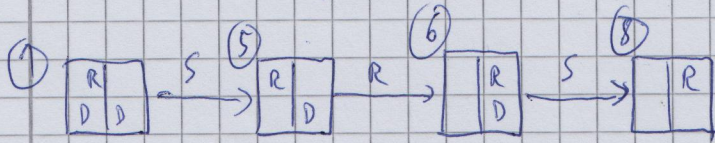


Murphy's Law for vacuum cleaners (variant A):

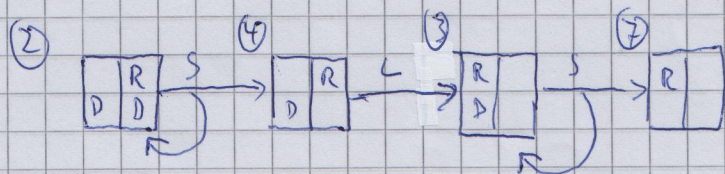
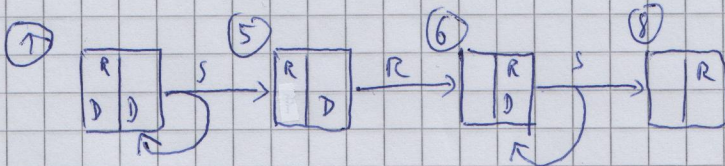
"If attempting to clean a square that is already clean, with 10% probability it will be dirty afterwards."



Murphy's Law does not matter here because the robot never cleans if it is in a room without dirt.

Murphy's Law for vacuum cleaner world, variant (B):

"25% of the time, the such action fails to clean the floor if it is dirty and deposit dirt unto the floor if it is clean."



⇒ There is no action sequence, but a policy to reach a goal state for each initial state

↳ mapping: {states} → {actions}

(Repeat "suck" action in a dirty room until clean (i.e. no failure))

Probability to remain in state ①/⑥/②/③ for n steps

(= n failed attempts): $P(\text{remain}(n)) = (0.25)^n = \frac{1}{4^n}$

⇒ $\lim_{n \rightarrow \infty} P(\text{remain}(n)) = 0$

⇒ robot will leave states ①/⑥/②/③ (and reach a goal state)

"almost surely" (= with probability 1).