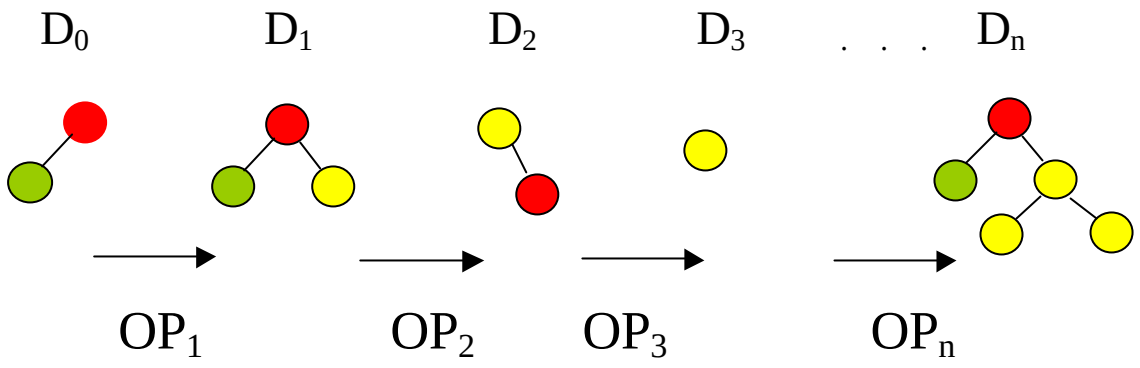
Amortized Analysis

using

Potential Method



Goal: computing $\Sigma_{i=1..n} \text{cost}(Op_i)$

Let $C(i)=\text{cost}(Op_i)$.

Define a potential function $\phi(i)$ for D_i

Amortized cost $C'(i) = C(i) + (\phi(i) - \phi(i-1))$

actual cost + potential difference

$$\Sigma_{i=1..n} C'(i) = \Sigma_{i=1..n} C(i) + \Sigma_{i=1..n} (\phi(i) - \phi(i-1))$$
$$= \Sigma_{i=1..n} C(i) + \phi(n) - \phi(0)$$

Hence, $\boxed{\Sigma_{i=1..n} C(i)}$ is bounded by $\boxed{\Sigma_{i=1..n} C'(i)}$,

provided that $\phi(n) - \phi(0) => 0$ easier to compute

Amortized Cost vs. Actual Cost