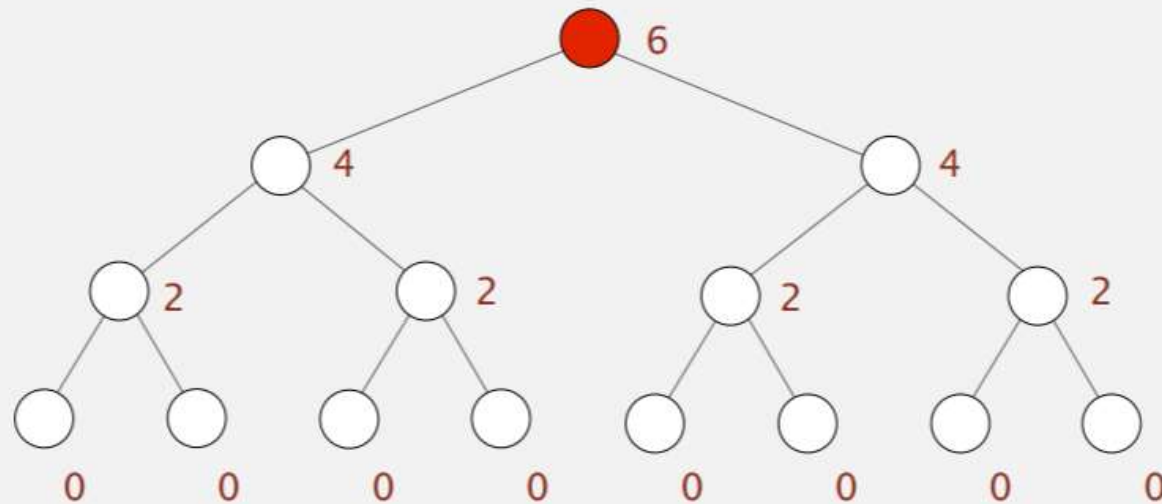


Sink-based (bottom up) heapification

Observation

- Given two heaps of height $h-1$.
- A heap of height h results by
 - Pointing the root of each heap at a new item.
 - Sinking that new item.
- Cost to sink: At most $2h$ compares.
- Total heap construction cost: $4*2 + 2*4 + 6 = 22$ compares



Sink-based (bottom up) heapification

Total Heap Construction Cost

- For $h=1$: $C_1 = 2$
- For $h=2$: $C_2 = 2C_1 + 2 \cdot 2$
- For h : $C_h = 2C_{h-1} + 2h$
- Total cost: Doubles with h (plus a small constant factor): Exponential in h
- Total cost: Linear in N

