Successive rejection (SR) algorithms

- Maintain a set of active arm A
- Pull arms from A following round robin rule
- Let $\text{LCB}_{\max}(t)$ be the maximum LCB of the arms at iteration t
- Remove an arm from the active set A if it has $\text{UCB}_a(t) \leq \text{LCB}_{\max}(t)$

Regret bound of Successive rejection algorithms

Theorem: Successive rejects algorithm pulls every suboptimal arm a atmost $O\left(\frac{\log(T)}{\Delta_a^2}\right)$ times or more precisely,

$$\mathbb{E}[N_a(T)] \leq 1 + \frac{32\log(T)}{\Delta_a^2}$$

Expected regret is at most:

$$\text{Reg}_T \leq O\left(\sum_{a \neq a^\star} \Delta_a + \sum_{a \neq a^\star} \frac{\log(T)}{\Delta_a}\right)$$