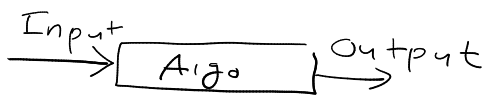
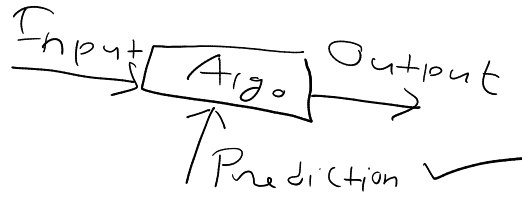


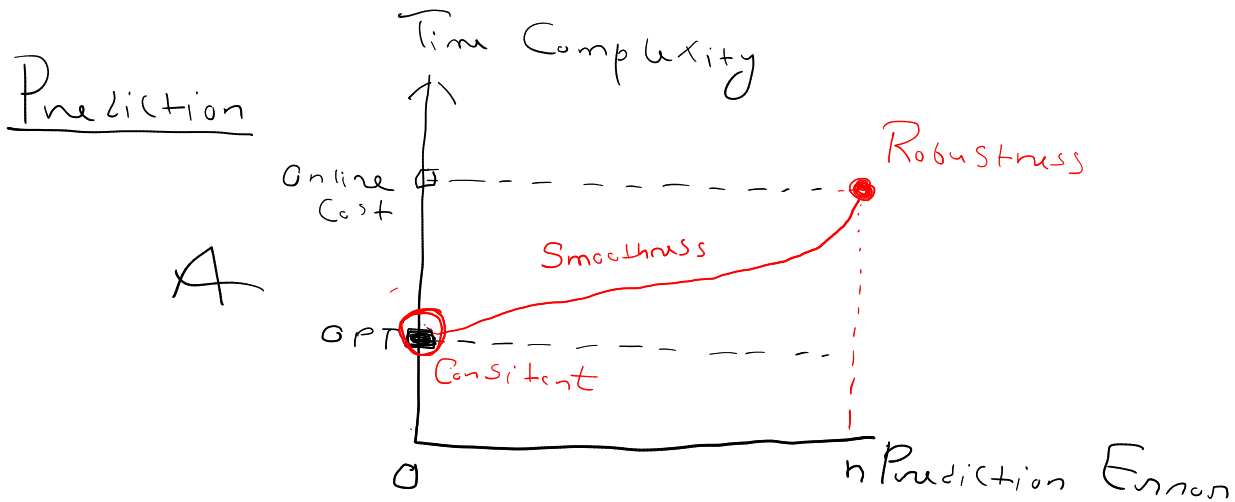
Learning Augmented Algo



- Do not use any data
- Worst Case / Amortized
- We cannot beat the lower bound



- We will use data from the past
- Better than Worst Case bounds
- We can go beyond lower bound.



Binary Search

5	8	15	19	21	28	35
1	2	3	4	5	6	7

$O(\log n)$

item $\rightarrow$ Index where item lies

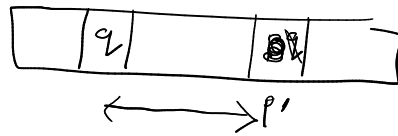
$h(\underline{q}) \rightarrow \underline{\text{Position}}$

$t(q) \rightarrow \text{Position}$

$h(q) \rightarrow \text{Position}'$

Array $[p'] == q \checkmark$ Done

$$q < p'$$



$$h(q), h(q)-2, h(q)-2^2, h(q)-2^3, \dots$$

$$h(q) = |h(q) - t(q)|$$

$q \quad p'$

$$\lceil 2 \log(h(q) - t(q)) \rceil$$

$$h(q) = t(q)$$

$$\log(n) \quad O(1)$$

(Kmeans)

$$\log(n)$$