Strategizing against wo-repret learners
setter is shategizing buyers are no-regret learners
Byyes values
1/4 prob 1/2
1/2 -11 1/4
1 -11- 1/4
best price, repeat T times
$p \sim 1$ revenue $\sim \frac{1}{4} = \frac{1}{4} \cdot 1$
Pn/2 -11- T4= I2. 12
PN 1/4 -1- 1/4 = T. 1/4
If buyer are wear based wo-repret player seller con do bette
"Auction" - buyer ask for ikm per/10

yes -> god ikm price [0,1] will be given latter

fine 1, ..., TPost T_2 item prize = 0

then price = 1

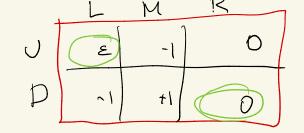
follow the leader learners after $\frac{1}{2} + x$ step

value y_2 1 y_2 1 y_2 1 y_3 1 y_4 2 y_5 1 y_6 2 y_6 1 y_6 1 y_6 2 y_6 1 y_6 2 y_6 1 y_6 2 y_6 1 y_6 2 y_6 2 y_6 3 y_6 4 y_6 1 y_6 1 y_6 2 y_6 1 y_6 2 y_6 3 y_6 4 y_6 1 y_6 1 y_6 2 y_6 1 y_6 2 y_6 3 y_6 4 y_6 5 y_6 6 y_6 7 y_6 1 y_6 1 y_6 1 y_6 2 y_6 1 y_6 2 y_6 3 y_6 4 y_6 5 y_6 6 y_6 7 y_6 7 y_6 7 y_6 8 y_6 9 y_6 1 y_6 2 y_6 1 y_6 2 y_6 1 y_6 2 y_6 2 y_6 1 y_6 2 y_6 2 y_6 3 y_6 4 y_6 5 y_6 6 y_6 6 y_6 7 y_6 7 y_6 8 y_6 9 y_6 1 y_6 2 y_6 1 y_6 2 y_6 3 y_6 4 y_6 5 y_6 6 y_6 6 y_6 6 y_6 7 y_6 7 y_6 8 y_6 9 y_6 9 y_6 9 y_6 1 y_6 9 y_6 1 y_6 2 y_6 3 y_6 4 y_6 1 y_6 1 y_6 1 y_6 2 y_6 3 y_6 4 y_6 5 y_6 6 y_6 7 y_6 8 y_6 9 y_6 9

 $x \leq \frac{\tau}{6}$

Revenue

$$\frac{T}{2} \cdot 4 \cdot \frac{1}{2} + \frac{T}{6} \cdot \frac{1}{2} = \frac{T}{4} + \frac{T}{12}$$
extra



no-repret player ~ L... L, R.R. R

Recall CE & CCE

correladeq coarse c.E.

advisor = correlato

no-repret

Jells you what to play

playin 1/2-1/2 on (VIL) & (D,R) is no-nepret

but not a CE

instead of R you prefer H

better learning guerentee

swep-regret:

S-Reg = $u \circ x = \sum u^{\dagger}(b) - \sum u^{\dagger}(b)$ b, b' t, $b^{\dagger} = b$ t: $b^{\dagger} = b$ Theorem: player down wo-swap reprediction

in 2-person game of opponent con

only get stacked beig value

Proof:

a:-- at b; ... bt

say player 2 was no swap regret.

We know to b

I u2(a1,b1) > I u2(a1,b') to

We know
$$\forall b$$

$$\sum_{\substack{t: b_t = b}} u_2(a_t, b_t) \geq \sum_{\substack{t: b_t = b}} u_2(a_t, b') \forall b'$$

$$\uparrow b_t = b$$

as leader player 1 con get $\sqrt[A]{b} \ge \frac{1}{4} (a_{i,b}) \cdot \frac{1}{4} (a_{i,b}) \cdot \frac{1}{4} (a_{i,b})$ $t: b_{i,b} = b$

player 2's best respone is b

to bound total value for player ($\sum_{t=1}^{T} u_{i}(b_{t},b_{t}) = \sum_{t=1}^{T} \sum_{t=1}^{T} u_{i}(a_{t},b_{t})$ $\leq \frac{1}{T} \sum_{t=1}^{T} \#(\text{fines } b_{t}=b) = V$