# Exercise 11.1: Discretization

## Exercise 11.1: Discretization

**Setup:**

- continuous function $f(x)$
- bounded derivative $f'(x) \leq 1$
- linear $\epsilon$-discritization of $[0,1]$:
  $X_\epsilon = \{x_0, \ldots, x_k\}$ with $x_j = \epsilon j$ and $k = 1/\epsilon$.

**Questions:**

- for $\epsilon = 0.5$, bound
  $\max_{x \in [0,1]} f(z) - \max_{x \in X_\epsilon} f(x)$
- for $\epsilon = 0.1$, bound
  $\max_{x \in [0,1]} f(z) - \max_{x \in X_\epsilon} f(x)$

# Lecture 11: Learning to Bid (Cont)

**Due Wednesday:** Project 3

# Lecture 11: Learning to Bid (Cont)

**Due Wednesday:** Project 3

**Last Time:**

- learning to bid
- discretization
- full feedback

# Lecture 11: Learning to Bid (Cont)

**Due Wednesday:** Project 3

**Last Time:**

- learning to bid
- discretization
- full feedback

**Today:**

- learning to bid (cont)
- partial feedback
- equilibrium of no-regret learning (coarse correlated equilibrium)

# Exercise 11.2: "Battle of the Sexes" Times Two

## Exercise 11.2: "Battle of the Sexes" Times Two

**Setup:**

- you are the row player.
- payoffs:

| | Opera | Football |
|---|---|---|
| **Opera** | **4**, 2 | **0**, 0 |
| **Football** | **0**, 0 | **2**, 4 |

- you will play two games sequentially with the same opponent.

**Questions:**

- In Game 1, you play (Opera, Opera); how do you play in Game 2?
- In Game 1, you play (Football, Football); how do you play in Game 2?