# Lecture 1 (Introduction)

## 1 Course Policy

1. Quizzes - 15% (suprise/announced)
2. Assignments - 20% (typed and groups of size $\leq 2$)
3. Minor - 30%
4. Major - 30%
5. Attendance - 5%
6. Class participation (if boderline of grade change)

## 2 Asymptotic Bound

1. $T(n) = O(f(n))$ if $\exists c, k \in \mathbb{R}$ such that $T(n) \leq c \cdot f(n) \forall n \geq k$
2. $T(n) = \Omega(g(n))$ if $\exists c, k \in \mathbb{R}$ such that $T(n) \geq c \cdot g(n) \forall n \geq k$
3. $T(n) = \Theta(h(n))$ if $T(n) = O(h(n))$ and $T(n) = \Omega(h(n))$

### 2.0.1 Task

Prove that $log(n) = O(n^{\varepsilon}) \ \forall \ \varepsilon > 0$

## 2.1 Problem

Given a histogram, find the maximum area of the rectangle that is present.

## 3 Rest of the Lecture

Discussing time complexities of merge-sort, Fibonacci - exponential vs *linear* (since for large $n$, the sum will not take constant time)