6.5610 Recitation 4 Practice Problems

Katherine Zhao

March 1, 2024

Katherine Zhao

6.5610 Recitation 4 Practice Problems

March 1, 2024

3)) J

Let $\mu : \mathbb{N} \to \mathbb{R}$ be a negligible function, and let p be a polynomial such that $p(k) \ge 0$ for all k > 0. State whether the following functions are negligible:

Let $\mu : \mathbb{N} \to \mathbb{R}$ be a negligible function, and let p be a polynomial such that $p(k) \ge 0$ for all k > 0. State whether the following functions are negligible:

• $c\mu(k)$ where c > 0 is a constant

Let $\mu : \mathbb{N} \to \mathbb{R}$ be a negligible function, and let p be a polynomial such that $p(k) \ge 0$ for all k > 0. State whether the following functions are negligible:

- $c\mu(k)$ where c > 0 is a constant
- $\mu(p(k))$

Let F be a PRF. Which of the following schemes are CPA secure encryption schemes?

Let F be a PRF. Which of the following schemes are CPA secure encryption schemes?

• $Enc(k, (m_1, m_2)) = (r_1, r_2, F(k, r_1) \oplus m_1, F(k, r_2) \oplus m_2)$ where r_1, r_2 are random

Let F be a PRF. Which of the following schemes are CPA secure encryption schemes?

- $Enc(k, (m_1, m_2)) = (r_1, r_2, F(k, r_1) \oplus m_1, F(k, r_2) \oplus m_2)$ where r_1, r_2 are random
- $Enc(k, m) = (r, F(k, m) \oplus r)$

Give a PIR scheme where we have O(N) bits for request and $O(\lambda)$ bits for response.

э