CS 333 – Algorithm Analysis

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Research Project

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Title: *Probabilistic Algorithm for Testing Primality*

The paper "Probabilistic Algorithm for Testing Primality" by Michael O. Rabin introduces a practical probabilistic approach to testing whether a given number is prime. The proposed algorithm relies on randomization, ensuring that if a number is determined to be composite, the result is always correct, whereas if a number is identified as prime, there is a very small probability of error. This makes it highly efficient for testing large numbers, outperforming classical deterministic methods. The paper provides theoretical foundations, implementation details, and experimental results demonstrating the algorithm's effectiveness. The research project will be purely theoretical, focusing on an in-depth discussion of foundational concepts and the analysis of experimental findings, without any implementation.

References:

• Rabin, Michael O. "Probabilistic Algorithm for Testing Primality." *Journal of Number Theory*, vol. 12, no. 2, 1980, pp. 128-138.