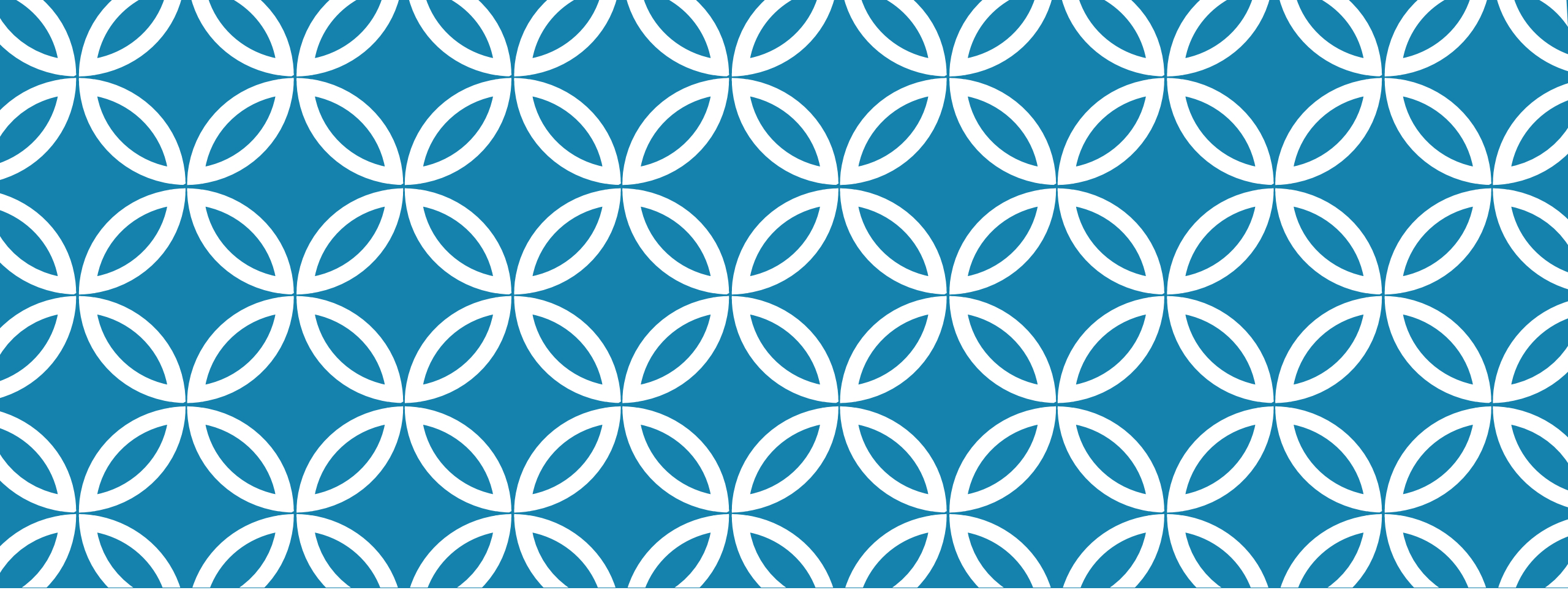

NUMBER THEORY

Sam Zhang

IS IT A PRIME?

$O(n)$ - too slow

$O(\sqrt{n})$ - must have a factor below square root

https://onlinejudge.u-aizu.ac.jp/courses/library/6/NTL/all/NTL_1_A

CALCULATE a^n

$$a^{2n} = (a^n)^2$$
$$a^{2n+1} = a^{2n} * a$$

https://onlinejudge.u-aizu.ac.jp/courses/library/6/NTL/all/NTL_1_B

GCD AND LCM

greatest common divisor/least common multiple

$$n * m = \gcd(n, m) * lcm(n, m)$$

$$\gcd(n, m) = \gcd(m, n - m)$$

https://onlinejudge.u-aizu.ac.jp/courses/library/6/NTL/all/NTL_1_C

FIND ALL THE PRIMES < N

- Sieve of Eratosthenes https://www.wikiwand.com/en/Sieve_of_Eratosthenes
- use primes to filter non-primes
- https://www.spoj.com/problems/PRIME1/