Krishnapriya Nair

September 18, 2019

CISP 400 - MW 5:30 pm

Project #1

Why are the largest known prime numbers Mersenne primes?

A prime number is a number that can only be divided by one and itself. The traditional method to calculate if a number, n, was a prime number would be to go through every number until the square root of n plus one and check if it was divisible. While this works effectively for small numbers, it becomes tedious for larger numbers. Mersenne primes numbers have a faster method of calculation.

A Mersenne number is “a positive integer that is one less than a power of two”. Therefore, “The nth Mersenne number is written: Mn = 2n-1.” If n is prime, it is speculated that Mn is also prime. One of the methods used to test this hypothesis is the Lucas Lehmer method. This method, and others such as this, explain why Mersenne primes are the largest known prime numbers. Calculating if large numbers, such as Mersenne numbers, are prime would not be efficiently done with traditional methods. By using methods such as Lucas Lehmer, the work is significantly reduced and allows for a greater success rate.