1 Tutorial 2

1. Find all primes ≤ 144 using the method of sieving designed by Eratosthenes. Draw a 12×12 grid and cross out all numbers that have been "sieved out" by the method.
2. Compute $(345^{28567} \times 23^{567} + 1078/65) \bmod 29$ given that 29 is a prime.
3. Use modular exponentiation to calculate $97^{5678} \bmod 101$.
4. Find $45623457^{-1} \bmod 2389511$ using the EGCD method.

For each of these questions you may write a program to solve it. You must show (and demonstrate understanding) of all the steps needed to arrive at the answer.