Program & Algorithm.

I developed two different algorithms for this assignment, once was semi successful one was not. The first attempt was a brute force method described in the assignment that listed all the prime numbers but only printed the last. Despite skipping even numbers to save time and even running tests that started much further on in the prime list the program took far too long to calculate the prime and even caused my laptop to overheat with the long run times and high difficulty algorithm.

The second method works in a different and quicker way but it results in a much less accurate answer that is closer to the Prime Number Theorem. Since prime number theorem estimates how many prime numbers exist below n this means that the prime number that is lower than n in 990000= n/ln(n) should in theory be the 990000th prime or a close estimate of it. With this in mind my second attempt at a program calculates the n for 990000 and then works backwards from there looking for the prime number that comes before n.

Result from the second algorithm:

Answer to Prime Number Theorem: 16449657
990 000th Prime: 16449599
Time to run (seconds): 31.8337929249

However, according to the only online calculator I could find, the 990000th prime is 15318907 and according to that same calculator the number 16449599 has 1058159 prime numbers smaller than it. The prime number theorem may be too inaccurate in this case and the brute force method would be much more accurate but way more time consuming.