

## SOMAS MATHS COMPETITION 2015 NUMBER SIEVE

HOBBIT, HERCULES AND HULK

For Figure 1 each cell in this  $100 \times 100$  grid represents a number. The cell in the  $i^{\text{th}}$  row and  $j^{\text{th}}$  column represents the number  $j + (i - 1)100$ . A cell is coloured **green** if it is prime number. A cell is coloured **red** if it is the number of squares we can create on some  $n \times n$  grid of dots. A cell is coloured **yellow** if it is a least  $n$  for some  $N$  which has been exhaustively checked by a computer programme. A cell is coloured **blue** if it is an integer power and not some a least possible  $n$  for some  $N$ .

Figure 2 is the same grid but the value of each cell increases in a spiralling pattern from the centre as in Ullam's Spiral.

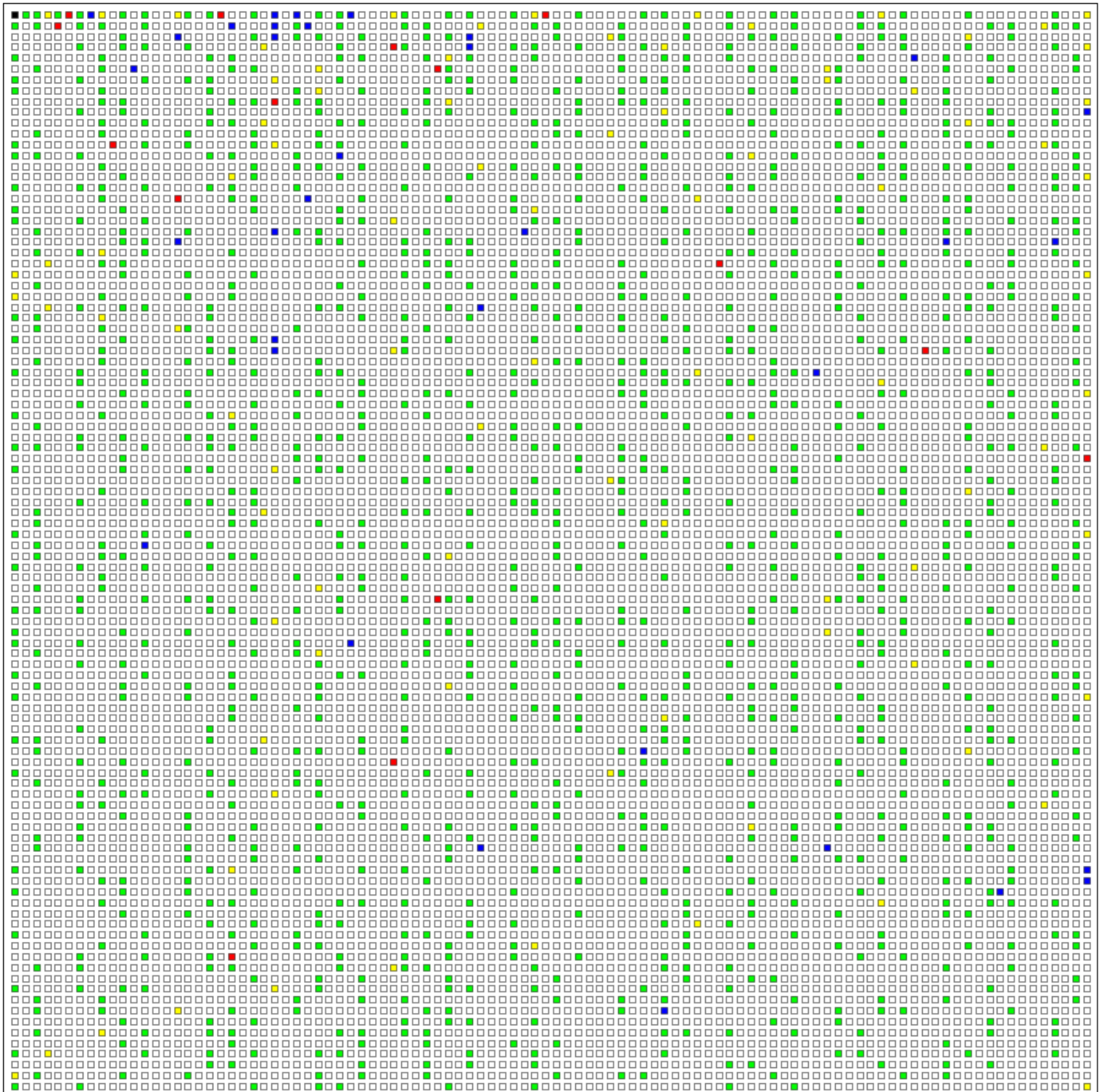


FIGURE 1

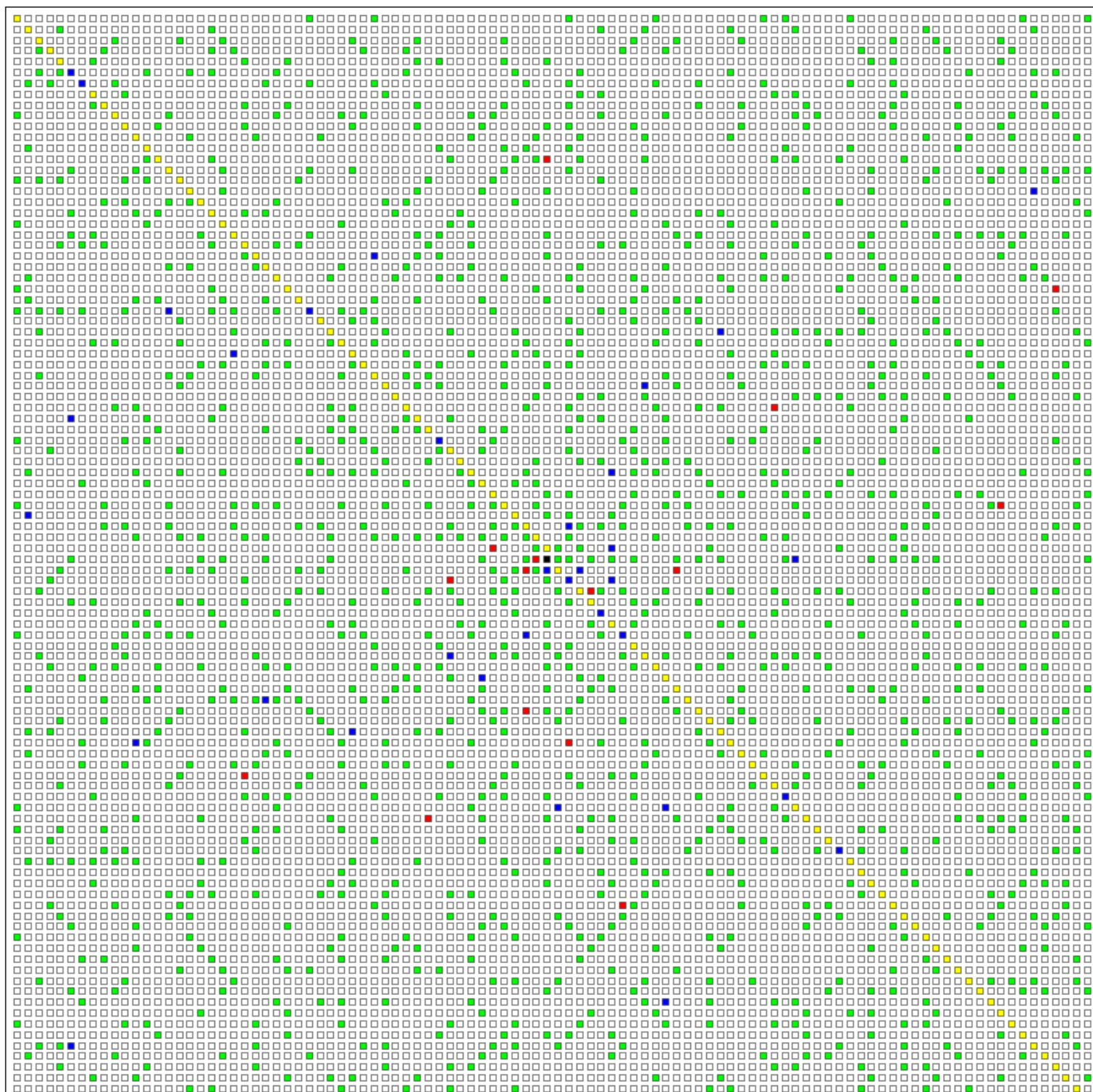


FIGURE 2