Functional form for possible comparator codes c given a layer count n is

$$c(n) = 3^n \frac{6!}{(6-n)!\ n!} \tag{1}$$

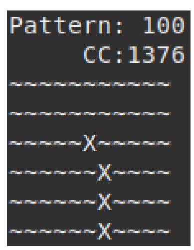
So

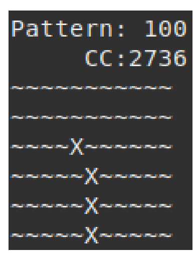
$c(0) =$	1
$c(1) =$	18
$c(2) =$	135
$c(3) =$	540
$c(4) =$	1215
$c(5) =$	1458
$c(6) =$	729

So the total number of invalid codes strictly by layer count is

$$\sum_{n<3} c(n) = 1 + 18 + 135 = 154 \tag{2}$$

Through the method of sorting, only one of two codes that take up only two neighboring columns will be found, i.e. they "track" itself is doubly degenerate within the pattern





The amount codes c_2 that are contained in a space of just two columns is given by

$$c_2(n) = 2^n \frac{6!}{(6-n)!\ n!} \tag{3}$$

$c_2(0) =$	1
$c_2(1) =$	12
$c_2(2) =$	60
$c_2(3) =$	160
$c_2(4) =$	240
$c_2(5) =$	192
$c_2(6) =$	64

So the amount of doubly degenerate codes with more than three hits is

$$\sum_{n>2} c_2(n) = 160 + 240 + 192 + 64 = 656 \tag{4}$$

Similarly the amount of triply degenerate codes c_3 is given by

$$c_3(n) = \frac{6!}{(6-n)!\ n!} \tag{5}$$

$c_3(0) =$	1
$c_3(1) =$	6
$c_3(2) =$	15
$c_3(3) =$	20
$c_3(4) =$	15
$c_3(5) =$	6
$c_3(6) =$	1

So the amount of triply degenerate codes with more than three hits is

$$\sum_{n>2} c_3(n) = 20 + 15 + 6 + 1 = 42 \tag{6}$$

We start with 4096 possible comparator codes to select from for a given pattern. We have 154 that are made invalid strictly by the layer count requirement. by subtracting the at least doubly degenerate subset from the remaining ones, we get rid of the portion of codes that will never be seen by the sorting algorithm. Doing it again for the triply degenerate case effectively gets rid of the two that will never be seen in the same way. Thus the total amount of valid codes v for a particular pattern is given by

$$v = 4096 - 154 - 656 - 42 = 3244 \tag{7}$$