

RMS Technology Consulting Test

In the below 10x10 grid, three numbers along a horizontal line have been highlighted.

8	2	22	97	38	15	0	40	0	75
49	49	99	40	17	81	18	57	60	87
81	49	31	73	55	79	14	29	93	71
52	70	95	23	4	60	11	42	69	24
22	31	16	71	51	67	63	89	41	92
24	47	32	60	99	3	45	2	44	75
32	98	81	28	64	23	67	10	26	38
67	26	20	68	2	62	12	20	95	63
24	55	58	5	66	73	99	26	97	17
21	36	23	9	75	0	76	44	20	45

The product of these numbers is $4 \times 60 \times 11 = 2640$.

Questions

1. How many different combinations are there of three adjacent numbers in the same direction (up, down, left, right or diagonally) in the 10 x 10 grid?
2. What is the greatest product of three adjacent numbers in the same direction (up, down, left, right or diagonally) in the 10 x 10 grid?

Requirements

Submit your answers to each of the above questions along with a link to your source code. The solution should be submitted in Python.

Your source code will be held in GitHub and should contain a function which accepts a grid of size $n \times m$ and finds the greatest product of x adjacent numbers in the same direction. We will be running a large grid (much larger than the above example) through your method. In Python, the function signature could look like the following:

```
def find_greatest_product_of_contiguous_integers(grid: NumberGrid,  
contiguous_integers: int) -> int:
```

Please also attach any relevant notes/comments along with your submission. Clean, readable, testable code is preferred.

Clarifications

In the sample grid below, the highlighted cells are considered the same combination of numbers whether they are red left-to-right or right-to-left:

1	2	3	4
2	3	4	5
3	4	5	6
4	5	6	7

In the sample grid below, the red highlighted cells should be considered a different combination of numbers to the blue highlighted cells.

1	2	3	4
2	3	4	5
3	4	5	6
4	5	6	7