Project Euler #11: Largest product in a grid

This problem is a programming version of Problem 11 from projecteuler.net

In the 20×20 grid below, four numbers along a diagonal line have been marked in bold.

\text{89 90 95 97 38 15 00 40 00 75 04 05 07 78 52 12 50 77 91 08}
\text{49 49 99 40 17 81 18 57 60 87 17 40 98 43 69 48 04 56 62 00}
\text{81 49 31 73 55 79 14 29 93 71 40 67 53 88 30 03 49 13 36 65}
\text{52 70 95 23 04 60 11 42 69 24 68 56 01 32 56 71 37 02 36 91}
\text{22 31 16 71 51 67 63 89 41 92 36 54 22 40 40 28 66 33 13 80}
\text{24 47 32 60 99 03 45 02 44 75 33 53 78 36 84 20 35 17 12 50}
\text{32 98 81 28 64 23 67 10 } \textbf{26 } \text{38 40 67 59 54 70 66 18 38 64 70}
\text{67 26 20 68 02 62 12 20 95 } \textbf{63 } \text{94 39 63 08 40 91 66 49 94 21}
\text{24 55 58 05 66 73 99 26 97 17 } \textbf{78 } \text{78 96 83 14 88 34 89 63 72}
\text{21 36 23 09 75 00 76 44 20 45 35 } \textbf{14 } \text{00 61 33 97 34 31 33 95}
\text{78 17 53 28 22 75 31 67 15 94 03 80 04 62 16 14 09 53 56 92}
\text{16 39 05 42 96 35 31 47 55 58 88 24 00 17 54 24 36 29 85 57}
\text{86 56 00 48 35 71 89 07 05 44 44 37 44 60 21 58 51 54 17 58}
\text{19 80 81 68 05 94 47 69 28 73 92 13 86 52 17 77 04 89 55 40}
\text{04 52 08 83 97 35 99 16 07 97 57 32 16 26 26 79 33 27 98 66}
\text{88 36 68 87 57 62 20 72 03 46 33 67 46 55 12 32 63 93 53 69}
\text{04 42 16 73 38 25 39 11 24 94 72 18 08 46 29 32 40 62 76 36}
\text{20 69 36 41 72 30 23 88 34 62 99 69 82 67 59 85 74 04 36 16}
\text{20 73 35 29 78 31 90 01 74 31 49 71 48 86 81 16 23 57 05 54}
\text{01 70 54 71 83 51 54 69 16 92 33 48 61 43 52 01 89 19 67 48}

The product of these numbers is 26 × 63 × 78 × 14 = 1788696.

What is the greatest product of four adjacent numbers in the same direction (up, down, left, right, or diagonally) in the 20×20 grid?

Input Format
Input consists of 20 lines each containing 20 integers.

Output Format
Print the required answer.

Constraints
0 \le Each integer in the grid \le 100

Sample Input

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89 90 95 97 38 15 00 40 00 75 04 05 07 78 52 12 50 77 91 08
49 49 99 40 17 81 18 57 60 87 17 40 98 43 69 48 04 56 62 00
81 49 31 73 55 79 14 29 93 71 40 67 53 88 30 03 49 13 36 65
52 70 95 23 04 60 11 42 69 24 68 56 01 32 56 71 37 02 36 91
22 31 16 71 51 67 63 89 41 92 36 54 22 40 40 28 66 33 13 80
24 47 32 60 99 03 45 02 44 75 33 53 78 36 84 20 35 17 12 50
32 98 81 28 64 23 67 10 26 38 40 67 59 54 70 66 18 38 64 70
67 26 20 68 02 62 12 20 95 63 94 39 63 08 40 91 66 49 94 21
24 55 58 05 66 73 99 26 97 17 78 78 96 83 14 88 34 89 63 72
21 36 23 09 75 00 76 44 20 45 35 14 00 61 33 97 34 31 33 95
78 17 53 28 22 75 31 67 15 94 03 80 04 62 16 14 09 53 56 92
16 39 05 42 96 35 31 47 55 58 88 24 00 17 54 24 36 29 85 57
86 56 00 48 35 71 89 07 05 44 44 37 44 60 21 58 51 54 17 58
19 80 81 68 05 94 47 69 28 73 92 13 86 52 17 77 04 89 55 40
04 52 08 83 97 35 99 16 07 97 57 32 16 26 26 79 33 27 98 66
88 36 68 87 57 62 20 72 03 46 33 67 46 55 12 32 63 93 53 69
04 42 16 73 38 25 39 11 24 94 72 18 08 46 29 32 40 62 76 36
20 69 36 41 72 30 23 88 34 62 99 69 82 67 59 85 74 04 36 16
20 73 35 29 78 31 90 01 74 31 49 71 48 86 81 16 23 57 05 54
01 70 54 71 83 51 54 69 16 92 33 48 61 43 52 01 89 19 67 48
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Sample Output

73812150