**Challenges** | Matrix (2D Array) Traversal

|  |  |  |  |
| --- | --- | --- | --- |
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For each of the following challenges create a function that takes a dynamic 2D array (matrix) and returns a 1D array containing the result of the given traversal. An approach might be to create separate module files (Python), or class files (Java) for each of the grouped challenges, and access these from a central file/method.

## Row-wise traversal (row by row)

|  |  |  |  |
| --- | --- | --- | --- |
| A screenshot of a number game  Description automatically generated | A screenshot of a number game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a number game  Description automatically generated |
| Top-left to bottom-right | Top-right to bottom-left | Bottom-right to top-left | Bottom-left to top-right |

## Column-wise traversal (column by column)

|  |  |  |  |
| --- | --- | --- | --- |
| A screenshot of a number game  Description automatically generated | A screenshot of a number game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a number game  Description automatically generated |
| Top-left to bottom-right | Top-right to bottom-left | Bottom-right to top-left | Bottom-left to top-right |

## Diagonal traversal (corner to corner)

|  |  |  |  |
| --- | --- | --- | --- |
| A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated |
| Top-left to bottom-right | Top-right to bottom-left | Bottom-right to top-left | Bottom-left to top-right |

## Horizontal snake traversal (row by row)

|  |  |  |  |
| --- | --- | --- | --- |
| A screenshot of a number game  Description automatically generated | A screenshot of a number game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated |
| Top-left to bottom-left | Top-right to bottom-right | Bottom-right to top-right | Bottom-left to top-left |

## Vertical snake traversal (column by column)

|  |  |  |  |
| --- | --- | --- | --- |
| A screenshot of a game  Description automatically generated | A screenshot of a number game  Description automatically generated | A screenshot of a number game  Description automatically generated | A screenshot of a game  Description automatically generated |
| Top-left to top-right | Top-left to top-right | Bottom-right to bottom-left | Bottom-left to top-left |

## Boundary traversal

|  |  |  |  |
| --- | --- | --- | --- |
| A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated |
| Top | Right | Bottom | Left |
| A screenshot of a game  Description automatically generated | A screenshot of a number game  Description automatically generated |  |  |
| Clockwise | Anticlockwise |  |  |

## Spiral traversal (column by column)

|  |  |  |  |
| --- | --- | --- | --- |
| A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated |
| Outside in clockwise | Outside in anticlockwise | Inside out clockwise | Inside out anticlockwise |

## Zigzag traversal

|  |  |  |  |
| --- | --- | --- | --- |
| A screenshot of a number game  Description automatically generated | A screenshot of a number game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a number game  Description automatically generated |
| Top-left to bottom-right, column first | Top-right to bottom-left, column first | Bottom-right to top-left, column first | Bottom-left to top-right, column first |
| A screenshot of a number game  Description automatically generated | A screenshot of a number game  Description automatically generated | A screenshot of a game  Description automatically generated | A screenshot of a game  Description automatically generated |
| Top-left to bottom-right,  row first | Top-right to bottom-left,  row first | Bottom-right to top-left,  row first | Bottom-left to top-right,  row first |