What 3D arrays look like, some ways to construct them and their applications?

Omar · Follow
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A 3D array is a three-dimensional array of data. It is a rectangular array with three dimensions: rows, columns, and slices. The rows are represented by the first index, the columns are represented by the second index, and the slices are represented by the third index.

For example, the following code creates a 3D NumPy array with 3 rows, 4 columns, and 2 slices:

```
import numpy as np
```



```
print(array)
```

This code will print the following array:

```
[[[ 1  2  3  4]
  [ 5  6  7  8]
  [ 9 10 11 12]]

 [[13 14 15 16]
```

```
[17 18 19 20]
[21 2
```


As you can see, the array has 3 rows, 4 columns, and 2 slices. The first slice contains the first 3 rows of the array. The second slice contains the last 3 rows of the array.

There are three ways to construct 3D arrays in Python:

- Using the `array()` function
- Using the `reshape()` function
- Using nested lists

Here are some examples of how to construct 3D arrays using these methods:

```
# Using the array() function
array = np.array([[[1, 2, 3, 4], [5, 6, 7, 8], [9, 10, 11, 12]],
                  [[13, 14, 15, 16], [17, 18, 19, 20], [21, 22, 23, 24]]])

# Using the reshape() function
numbers = np.arange(24)
array = numbers.reshape(3, 4, 2)

# Using nested lists
array = [[[1, 2, 3, 4], [5, 6, 7, 8], [9, 10, 11, 12]],
         [[13, 14, 15, 16], [17, 18, 19, 20], [21, 22, 23, 24]]]
```

here are some applications of 3D arrays in real life:

- **Medical imaging:** 3D arrays are used to store medical images, such as MRI scans and CT scans. This allows doctors to view the images from different angles and to see the structures in the body in three dimensions.
- **Computer graphics:** 3D arrays are used to store 3D models of objects. This allows computer graphics artists to create realistic and interactive 3D scenes.
- **Video games:** 3D arrays are used to store the game world. This allows the game to be rendered in three dimensions and to allow the player to move around the world freely.

- **Virtual reality:** 3D arrays are used to store the virtual world. This allows the user to inte
- **Data vi** ensions. This can be helpful for understanding complex data sets.

These are just a few examples of the many applications of 3D arrays in real life. As 3D technology continues to develop, we can expect to see even more applications for 3D arrays in the future.

Here are some additional applications of 3D arrays:

- **3D printing:** 3D arrays can be used to store the data for 3D printed objects. This allows 3D printers to create objects with complex shapes and structures.
- **Machine learning:** 3D arrays can be used to store data for machine learning models. This allows machine learning models to learn from 3D data and to make predictions about the real world.
- **Robotics:** 3D arrays can be used to store data for robots. This allows robots to navigate their environment and to interact with objects in the real world.

I hope this helps! Let me know if you have any other questions.

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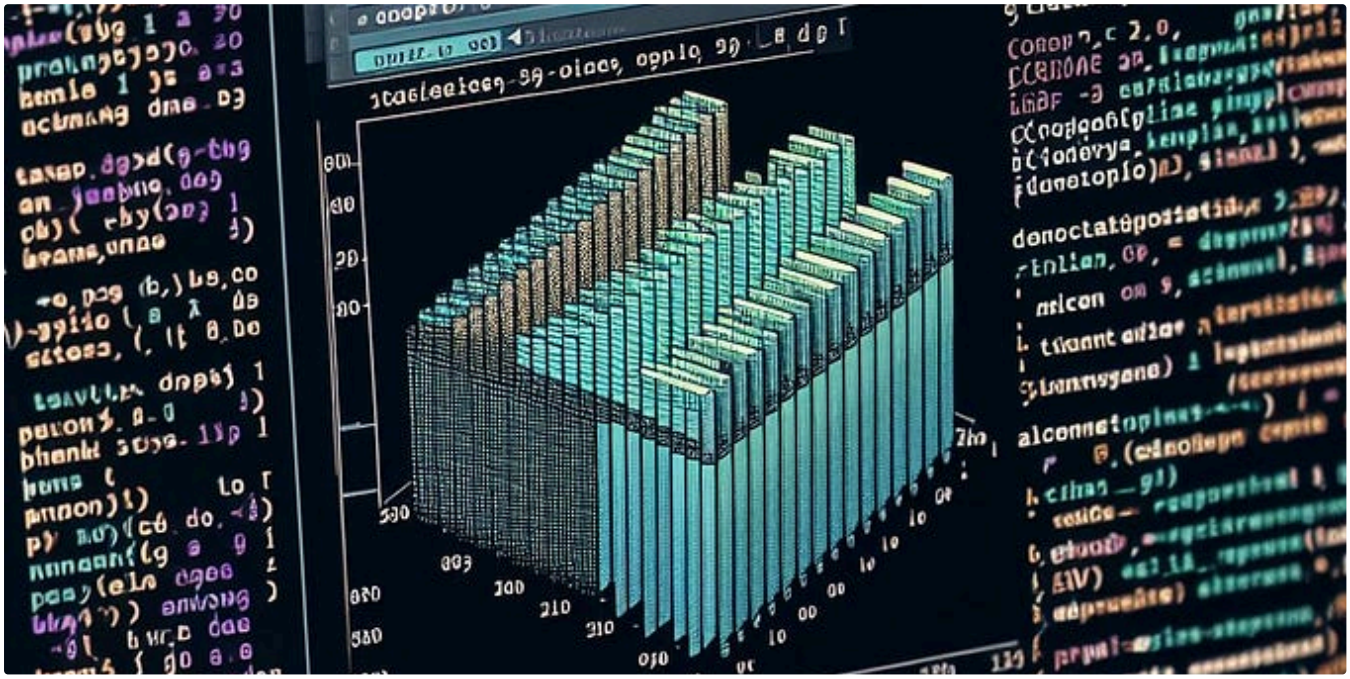

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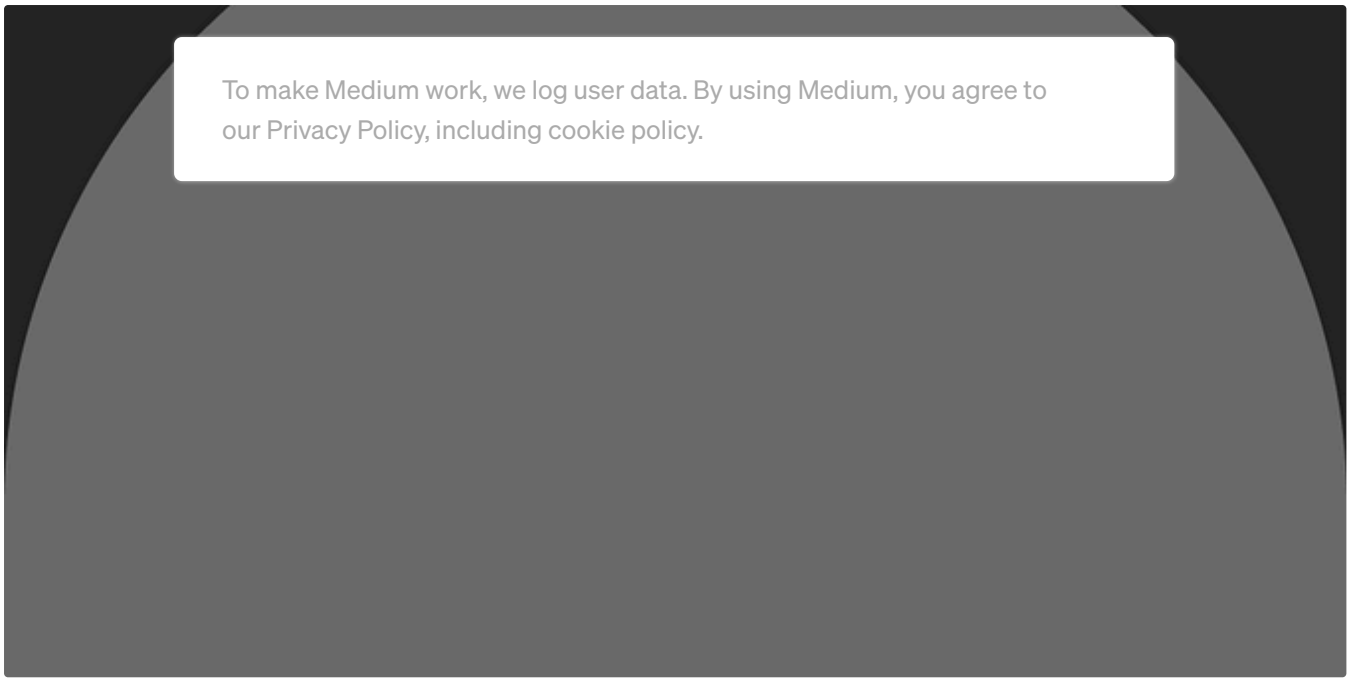

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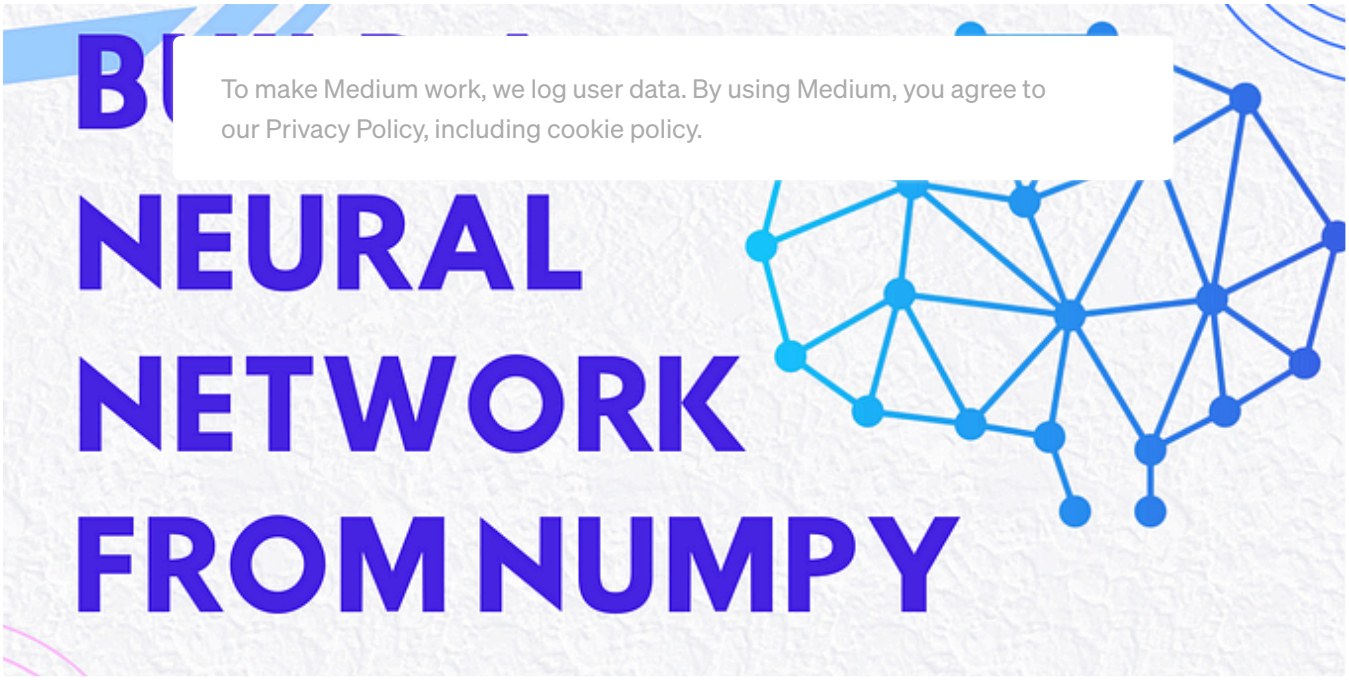

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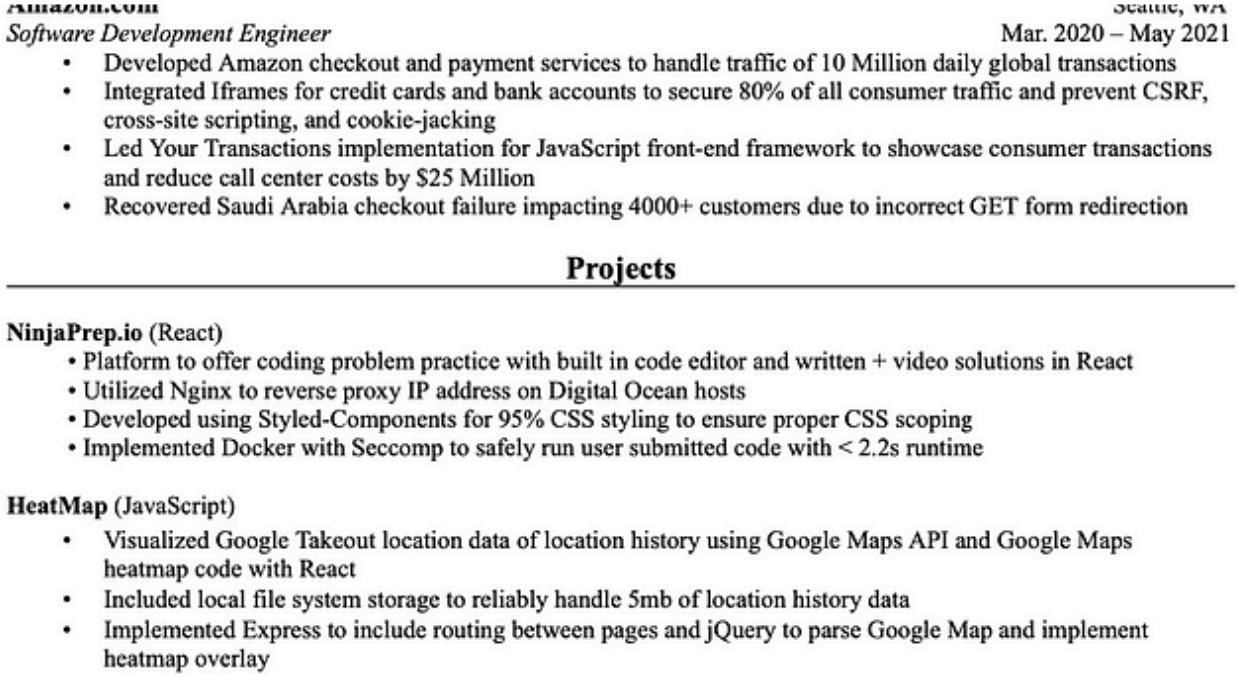

Amazon.com Seattle, WA
Software Development Engineer Mar. 2020 – May 2021

- Developed Amazon checkout and payment services to handle traffic of 10 Million daily global transactions
- Integrated Iframes for credit cards and bank accounts to secure 80% of all consumer traffic and prevent CSRF, cross-site scripting, and cookie-jacking
- Led Your Transactions implementation for JavaScript front-end framework to showcase consumer transactions and reduce call center costs by $25 Million
- Recovered Saudi Arabia checkout failure impacting 4000+ customers due to incorrect GET form redirection

Projects

NinjaPrep.io (React)
- Platform to offer coding problem practice with built in code editor and written + video solutions in React
- Utilized Nginx to reverse proxy IP address on Digital Ocean hosts
- Developed using Styled-Components for 95% CSS styling to ensure proper CSS scoping
- Implemented Docker with Seccomp to safely run user submitted code with < 2.2s runtime

HeatMap (JavaScript)
- Visualized Google Takeout location data of location history using Google Maps API and Google Maps heatmap code with React
- Included local file system storage to reliably handle 5mb of location history data
- Implemented Express to include routing between pages and jQuery to parse Google Map and implement heatmap overlay

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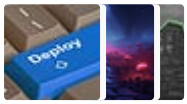

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7	1.239	2.167	2.833	4.255	6.346	9.04	12.02	14.07	18.48
8									20.09
9									21.67
10									23.21
11	3.053	4.575	5.578	7.584	10.341	13.70	17.28	19.68	24.72
12	3.571	5.226	6.304	8.438	11.340	14.85	18.55	21.03	26.22
13	4.107	5.892	7.042	9.299	12.340	15.98	19.81	22.36	27.69
14	4.660	6.571	7.790	10.165	13.339	17.12	21.06	23.68	29.14
15	5.229	7.261	8.547	11.037	14.339	18.25	22.31	25.00	30.58
16	5.812	7.962	9.312	11.912	15.338	19.37	23.54	26.30	32.00
17	6.408	8.672	10.085	12.792	16.338	20.49	24.77	27.59	33.41
18	7.015	9.390	10.865	13.675	17.338	21.60	25.99	28.87	34.80
19	7.633	10.117	11.651	14.562	18.338	22.72	27.20	30.14	36.19
20	8.260	10.851	12.443	15.452	19.337	23.83	28.41	31.41	37.57
22	9.542	12.338	14.041	17.240	21.337	26.04	30.81	33.92	40.29

Rohollah

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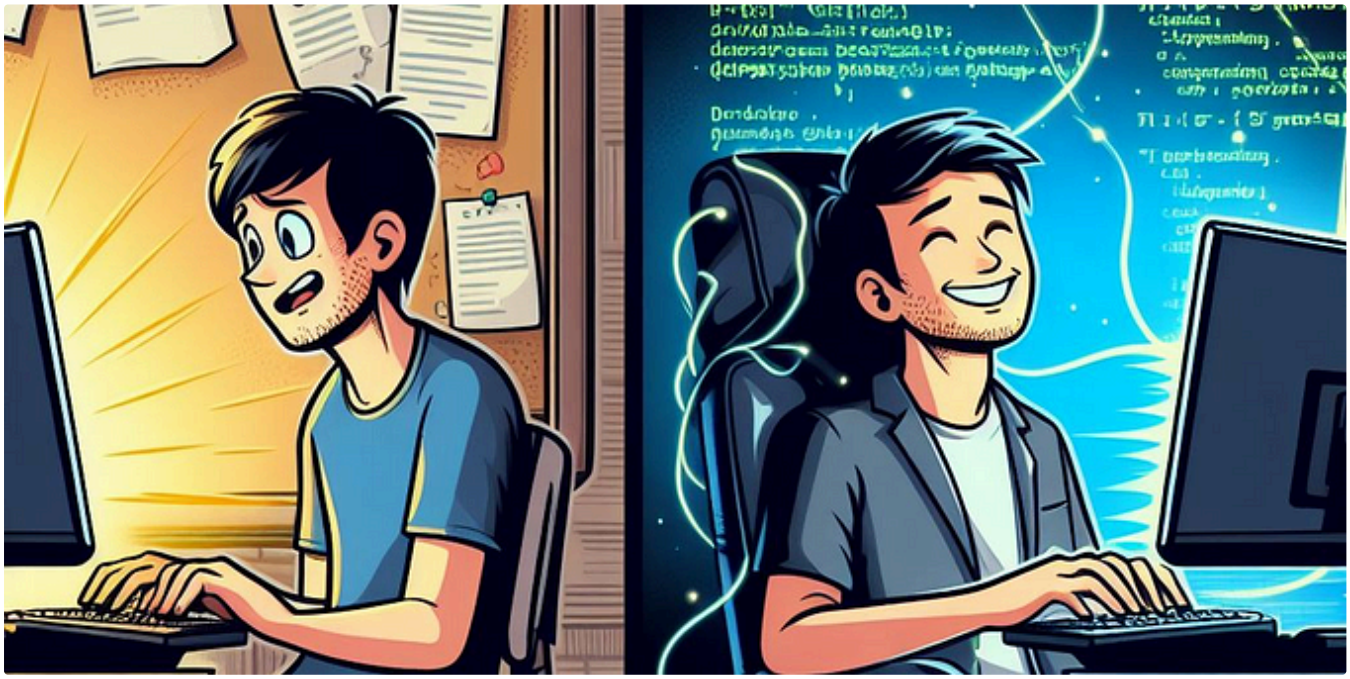

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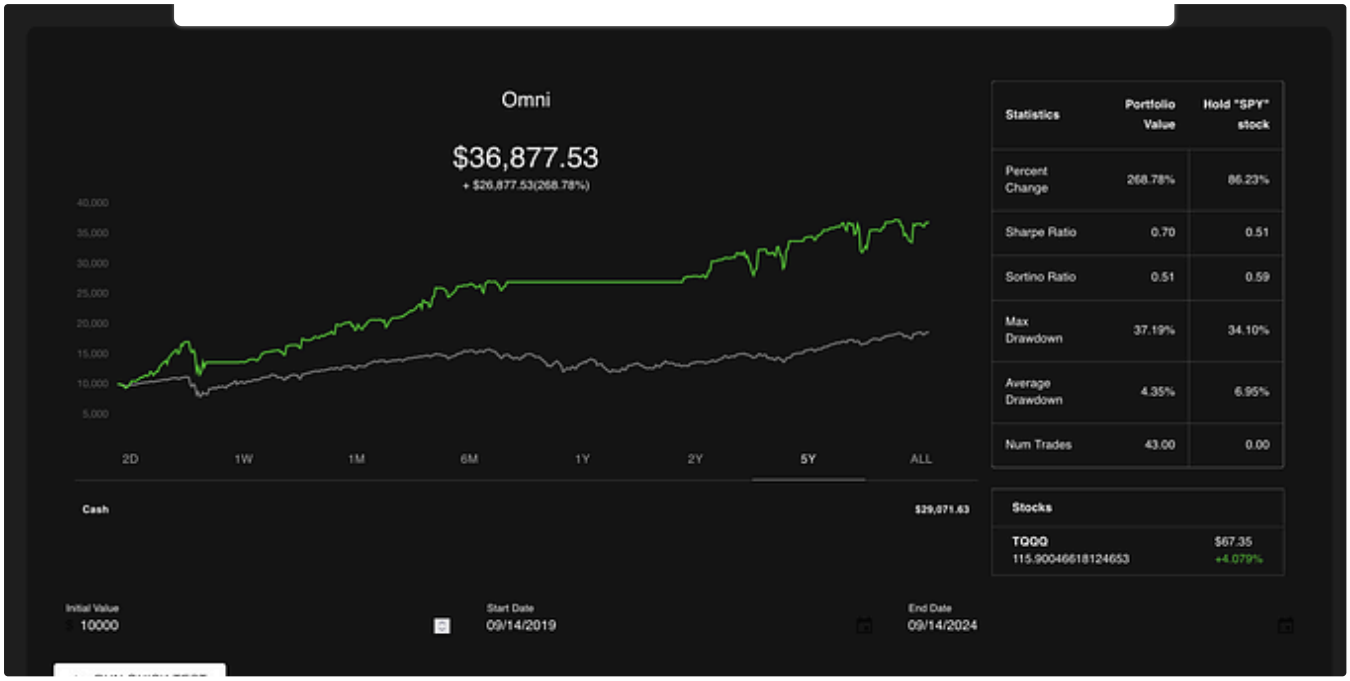

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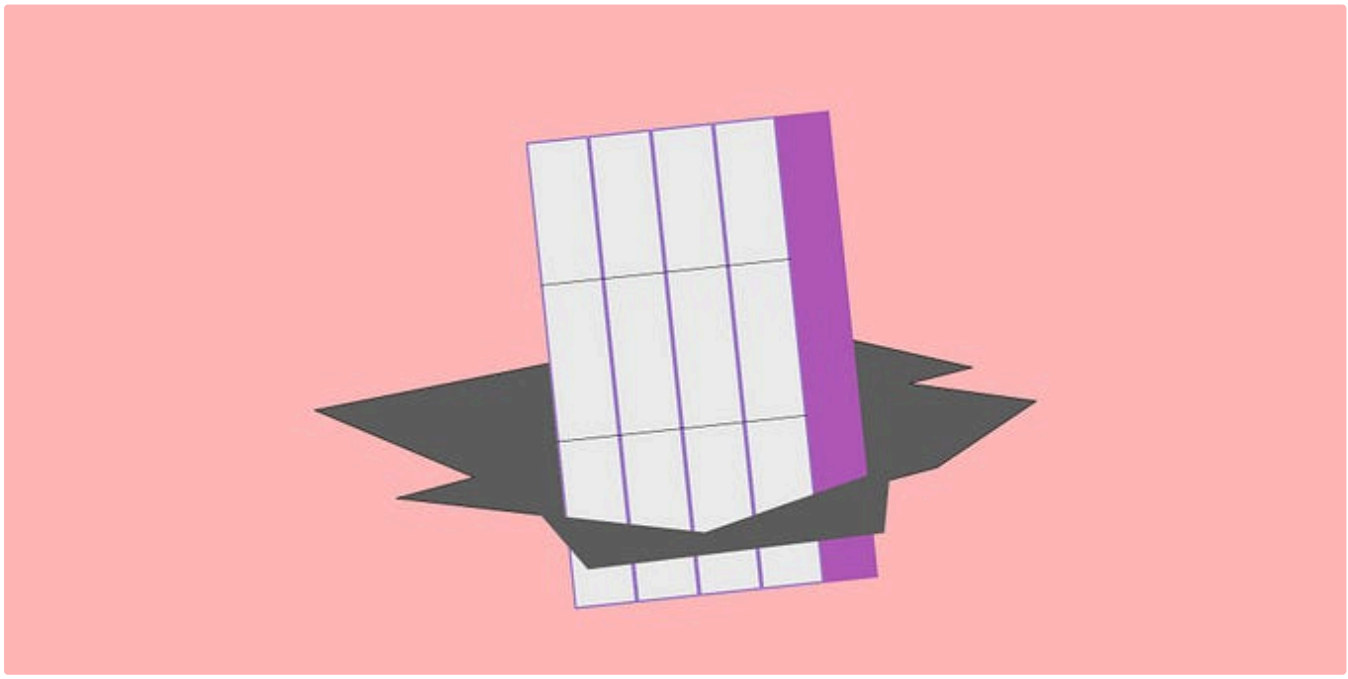

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