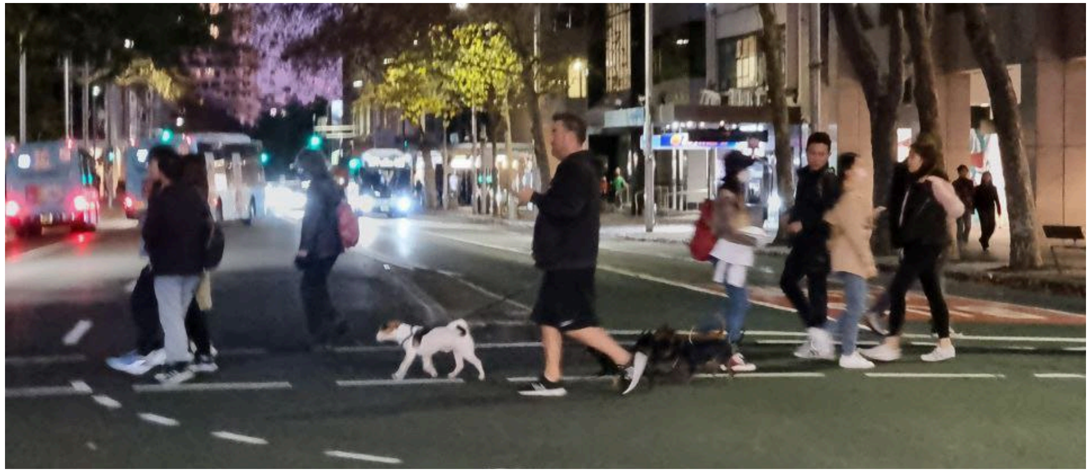
I saw these dogs



COMP1511 Week 5!

T14A: 2pm – 5pm

Tutors: Me + Vivian Zheng

My GitHub:

https://shorturl.at/zMTX5

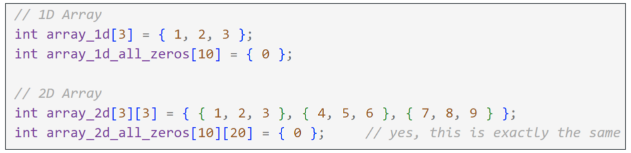
EdStem Lessons:

https://shorturl.at/krtG9

The Agenda

2D Arrays Recap (10 mins)

2D arrays are almost identical to 1D arrays

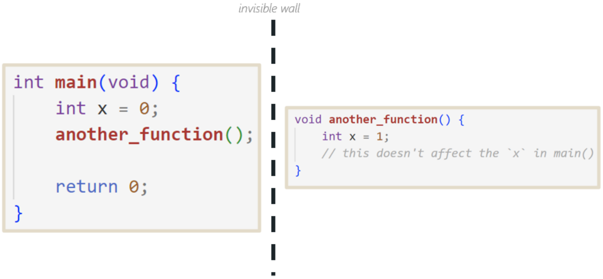


```
// 1D Array
int array_1d[3] = { 1, 2, 3 };
int array_1d_all_zeros[10] = { 0 };

// 2D Array
int array_2d[3][3] = { { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8, 9 } };
int array_2d_all_zeros[10][20] = { 0 };     // yes, this is exactly the same
```

Arrays + Functions (10 mins)

Functions have their own 'scopes', or, are their own 'boxes'



invisible wall

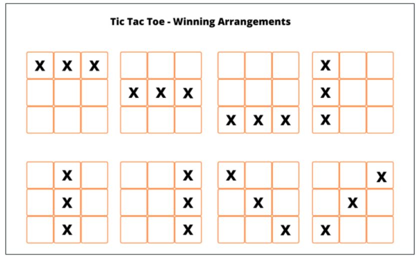
```
int main(void) {
    int x = 0;
    another_function();

    return 0;
}
```

```
void another_function() {
    int x = 1;
    // this doesn't affect the `x` in main()
}
```

2D Arrays Practice (20 mins)

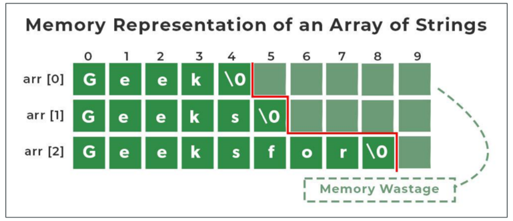
Let's play Tic-Tac-Toe!



Source: Geekflare

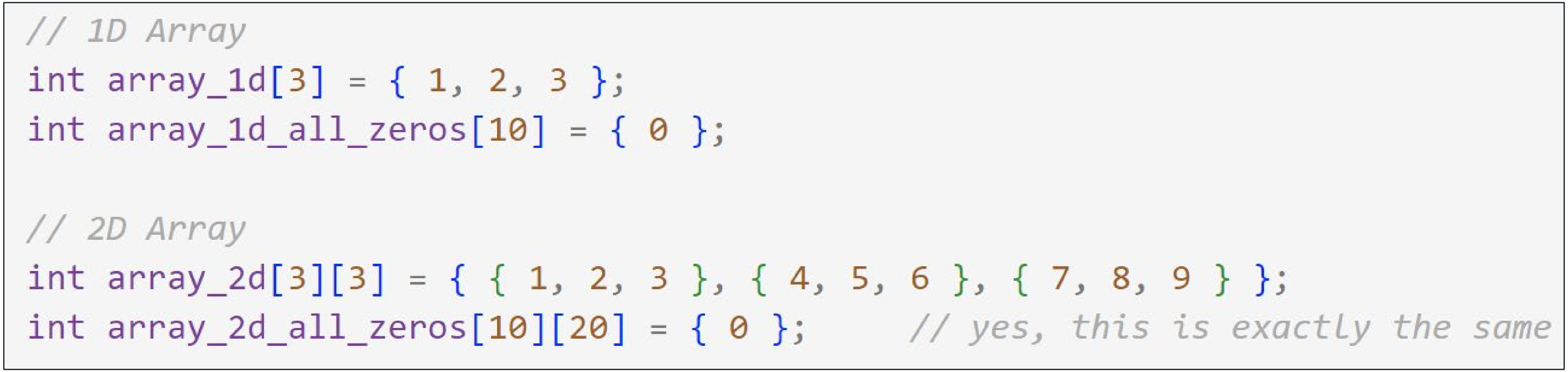
String Functions (20 mins)

Lastly, strings are arrays



Source: GeeksforGeeks

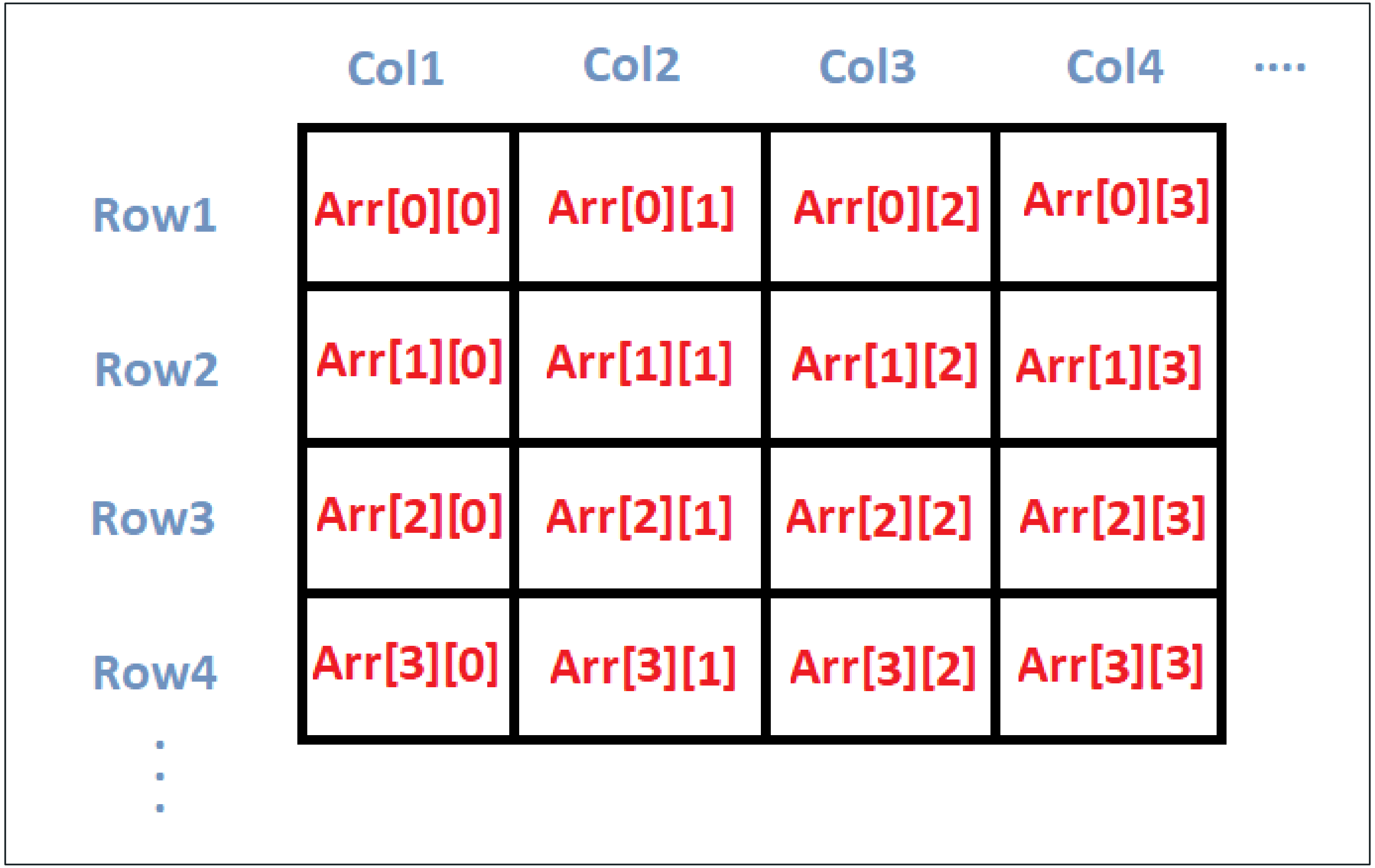
2D arrays are almost identical to 1D arrays



```
// 1D Array
int array_1d[3] = { 1, 2, 3 };
int array_1d_all_zeros[10] = { 0 };

// 2D Array
int array_2d[3][3] = { { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8, 9 } };
int array_2d_all_zeros[10][20] = { 0 };     // yes, this is exactly the same
```

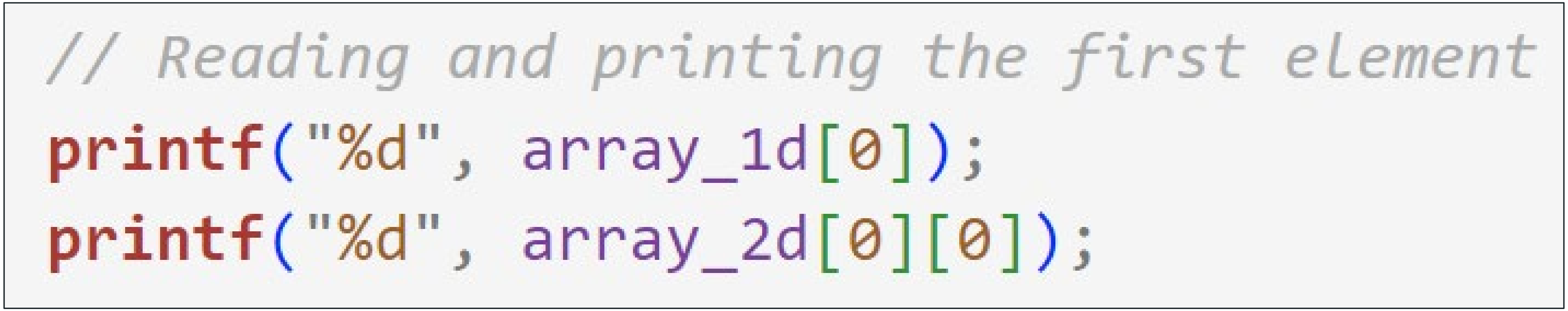
...including array indexing...



	Col1	Col2	Col3	Col4	....
Row1	Arr[0][0]	Arr[0][1]	Arr[0][2]	Arr[0][3]	
Row2	Arr[1][0]	Arr[1][1]	Arr[1][2]	Arr[1][3]	
Row3	Arr[2][0]	Arr[2][1]	Arr[2][2]	Arr[2][3]	
Row4	Arr[3][0]	Arr[3][1]	Arr[3][2]	Arr[3][3]	
⋮					

Source: DigitalOcean

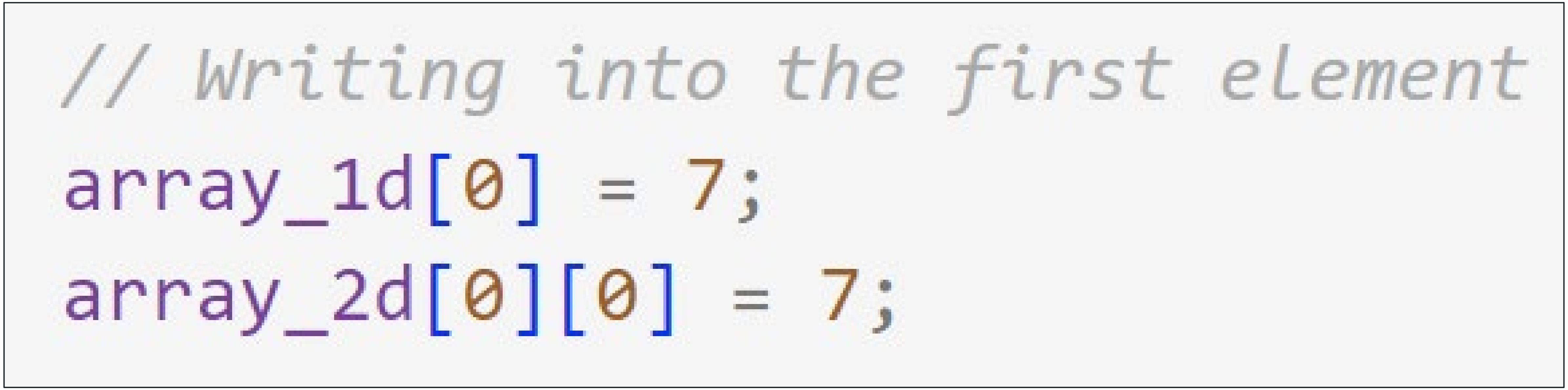
…or reading then printing…



```
// Reading and printing the first element
printf("%d", array_1d[0]);
printf("%d", array_2d[0][0]);
```

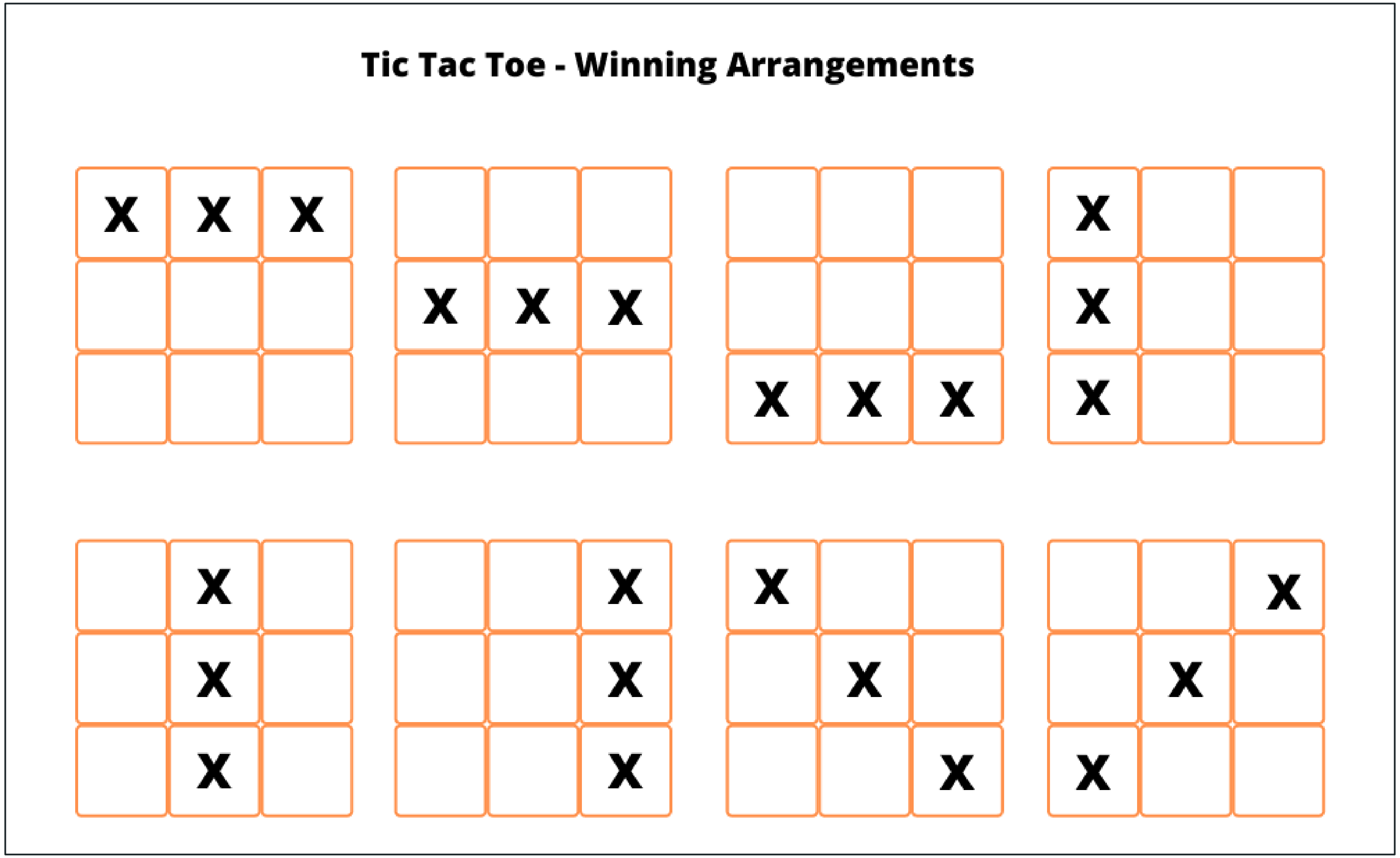
Source: 3 cups of coffee

…or writing to an index



```
// Writing into the first element
array_1d[0] = 7;
array_2d[0][0] = 7;
```

Let’s play Tic-Tac-Toe!



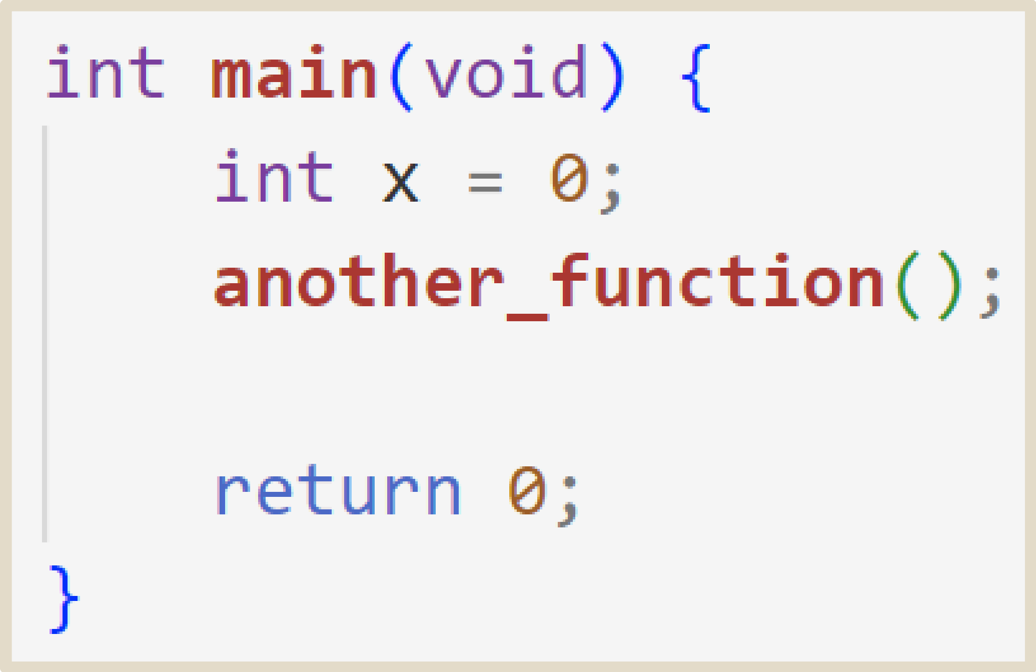
Tic Tac Toe - Winning Arrangements

Source: Geekflare

If you're interested, learn the minimax algorithm

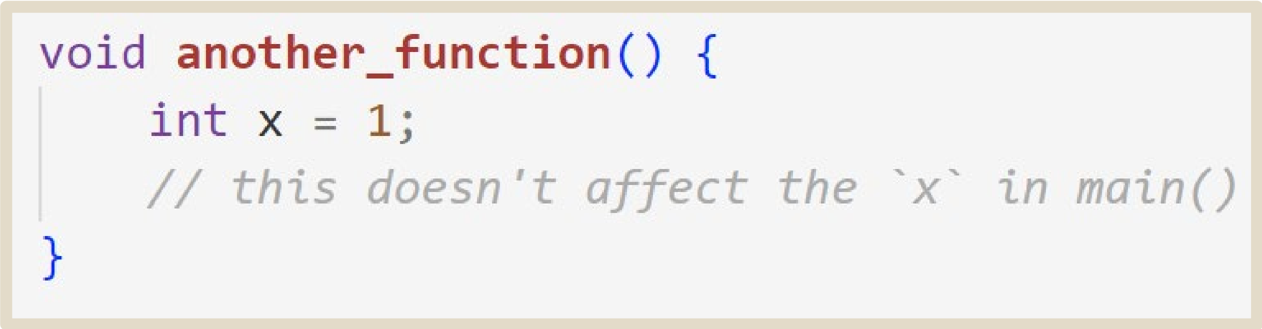
Functions have their own ‘scopes’, or, are their own ‘boxes’

invisible wall



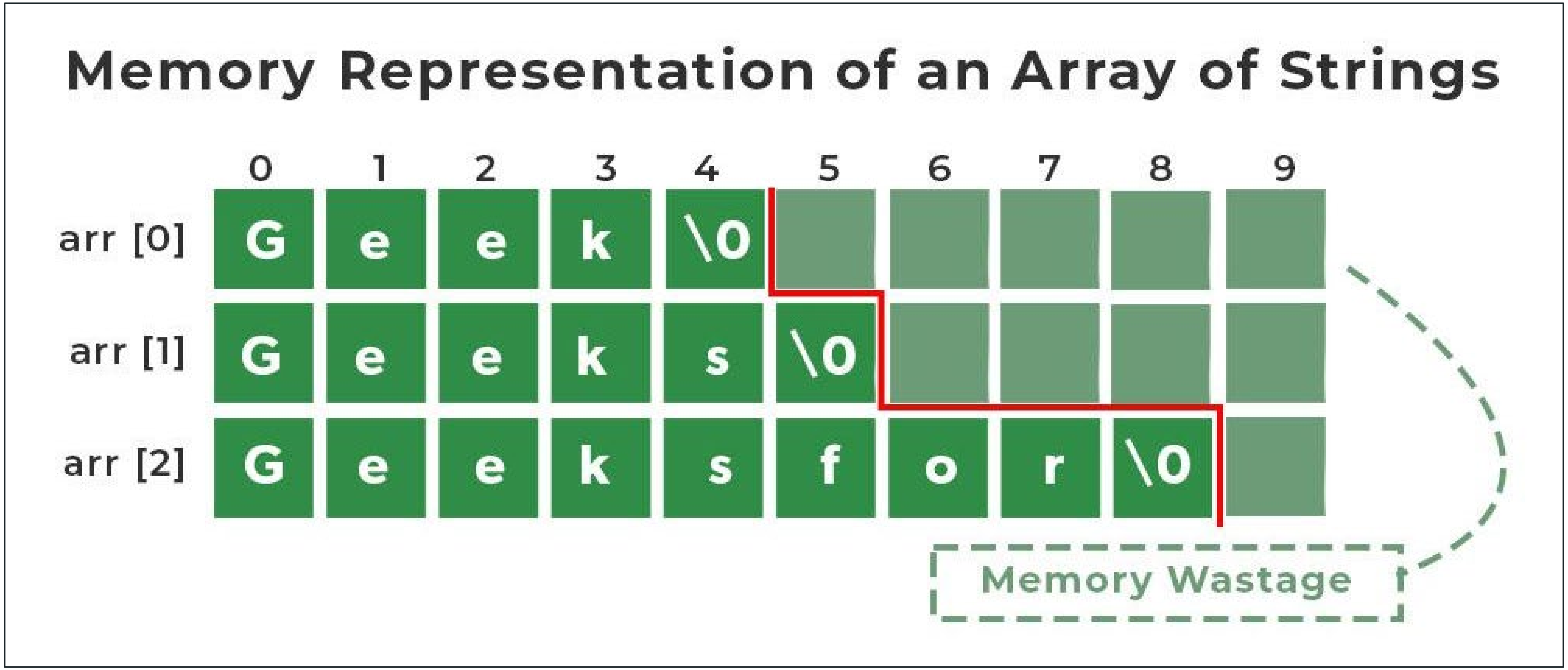
```c
int main(void) {
    int x = 0;
    another_function();

    return 0;
}
```



```c
void another_function() {
    int x = 1;
    // this doesn't affect the `x` in main()
}
```

Lastly, strings are arrays



Memory Representation of an Array of Strings

	0	1	2	3	4	5	6	7	8	9
arr [0]	G	e	e	k	\0					
arr [1]	G	e	e	k	s	\0				
arr [2]	G	e	e	k	s	f	o	r	\0	

Memory Wastage

Source: GeeksforGeeks