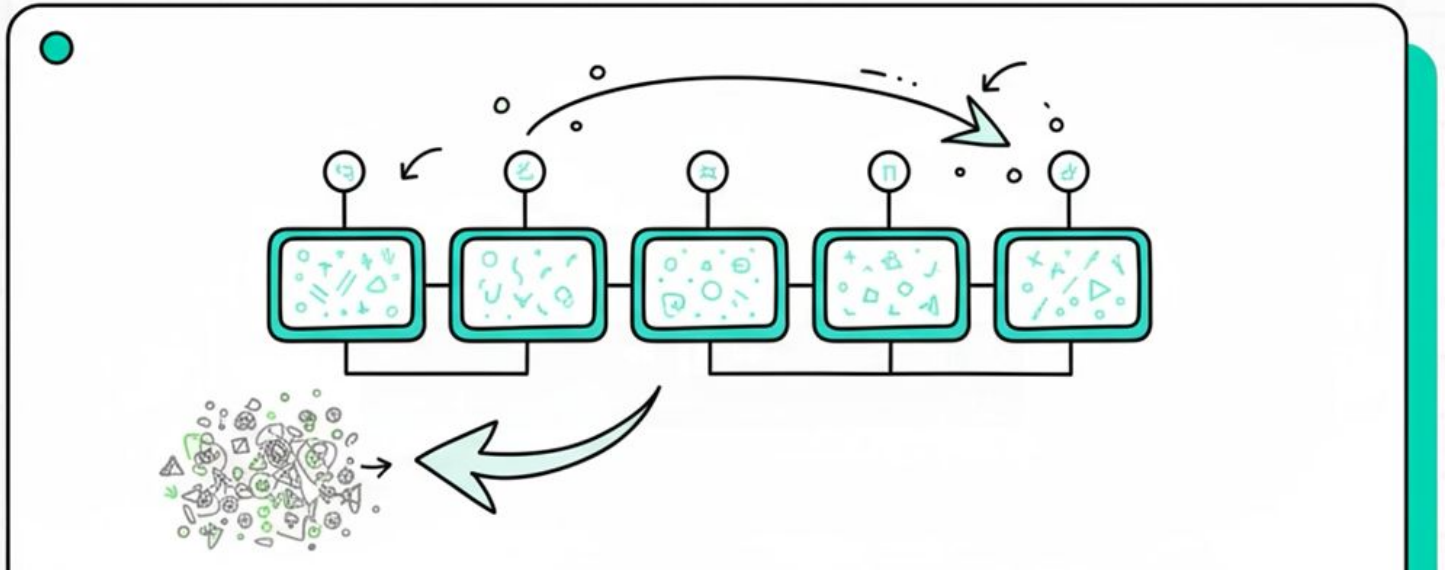
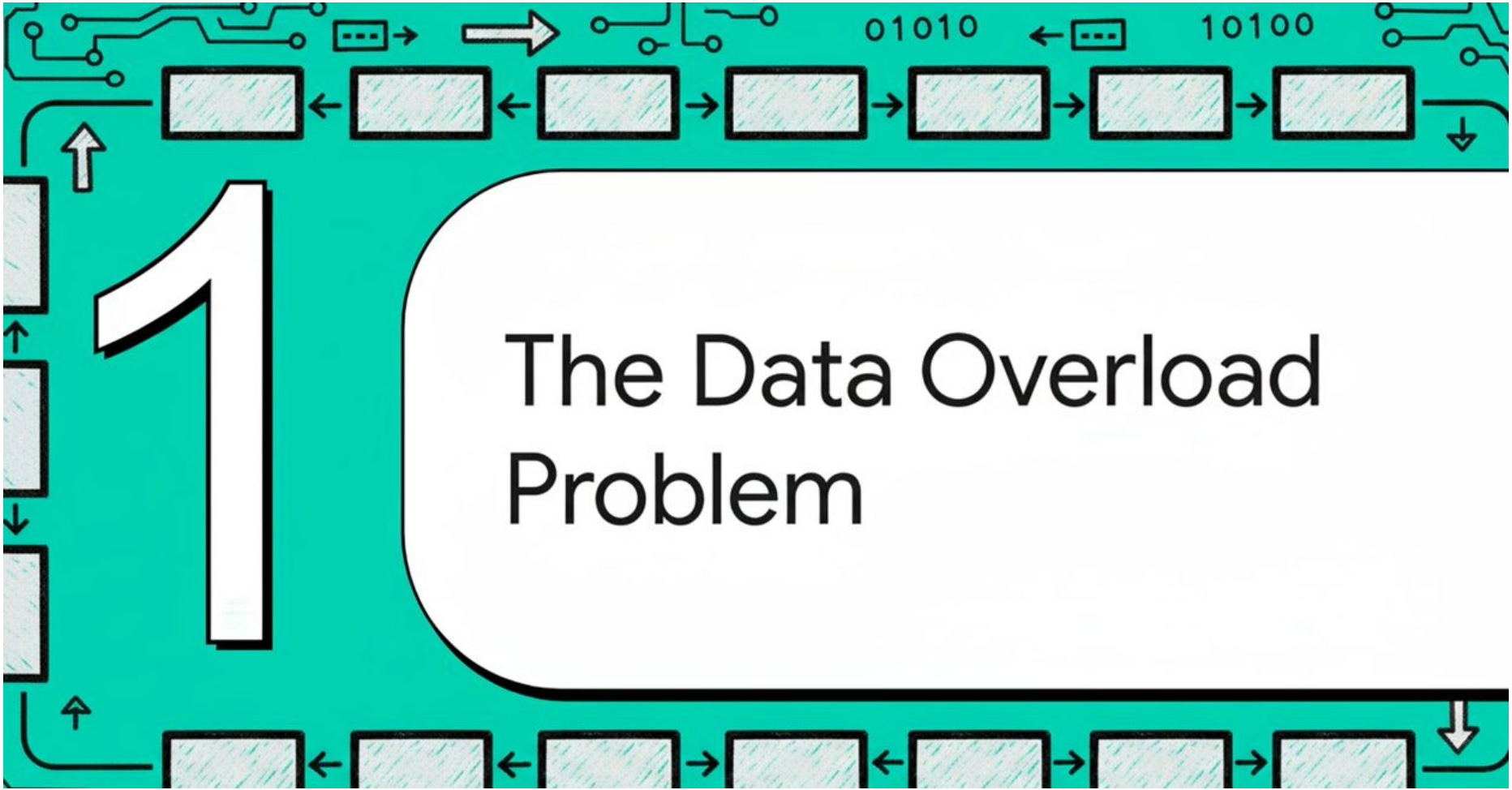
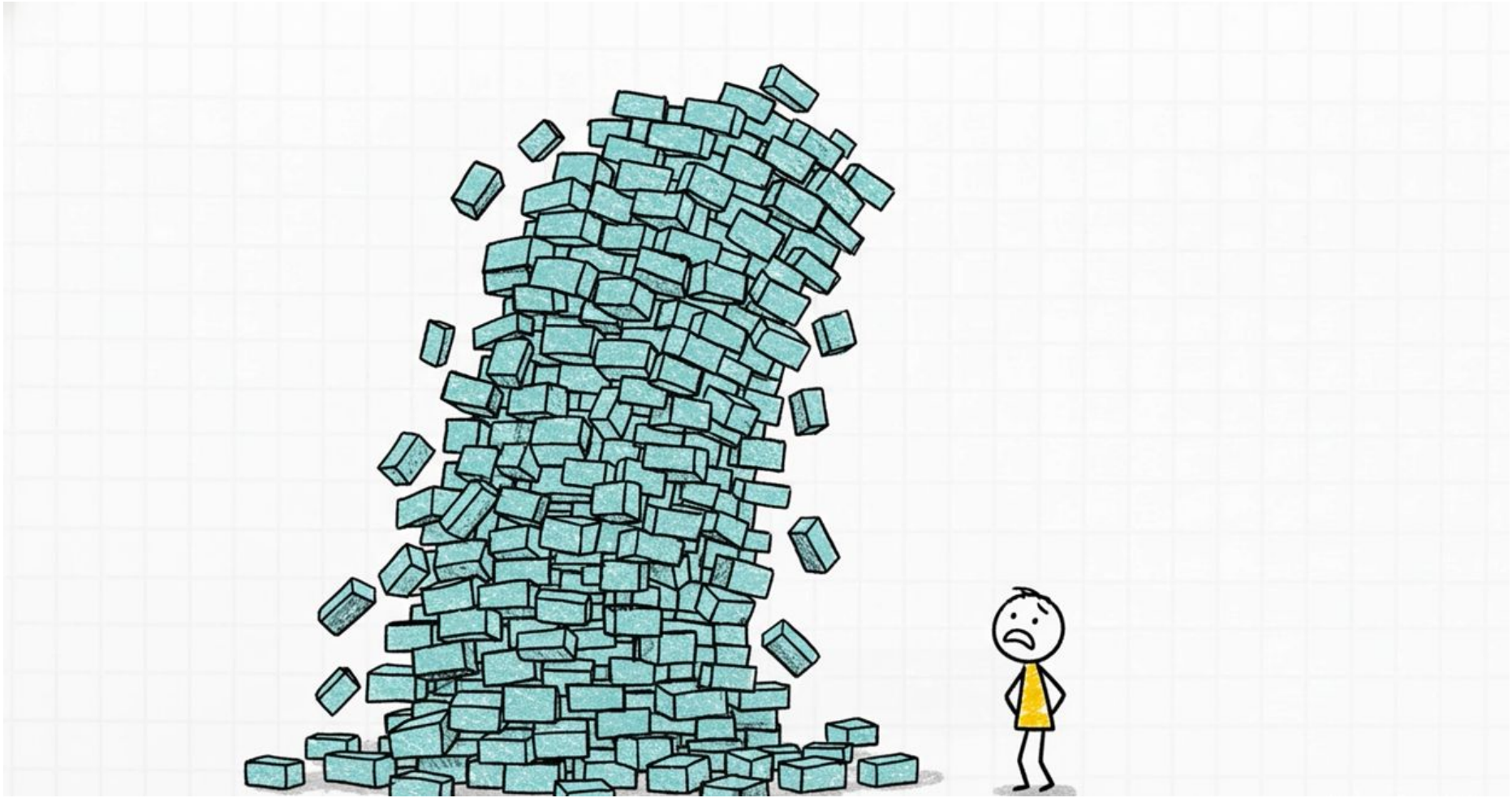
Week 8

The Explainer: C++ Arrays

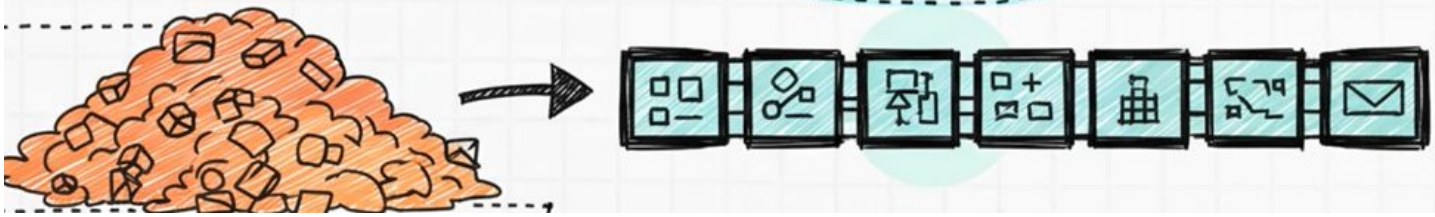


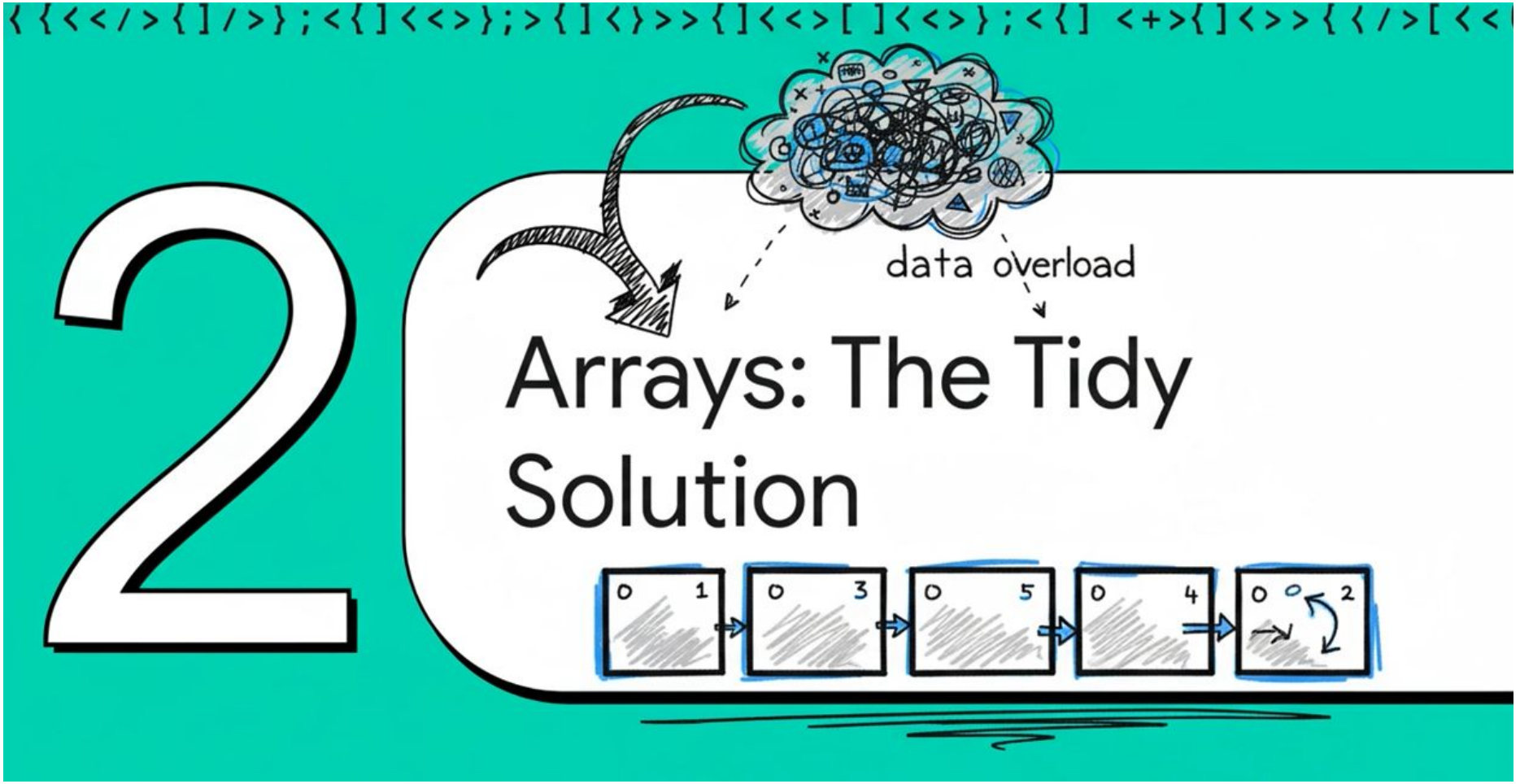

01010
10100
1
The Data Overload Problem

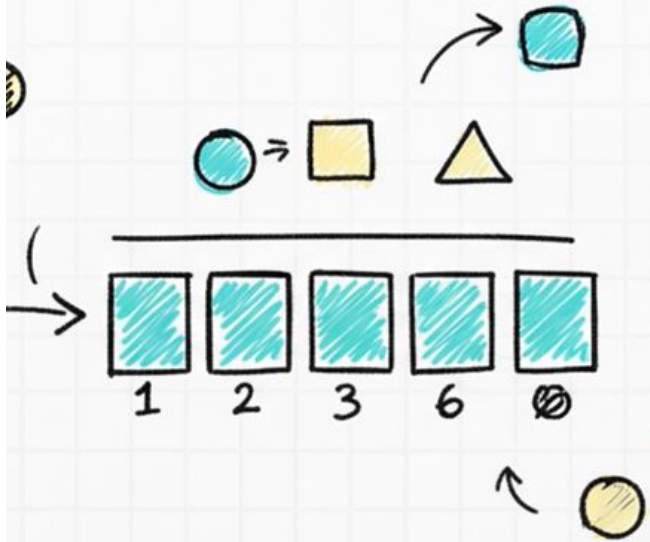

You need to store 50
student test scores.
How do you do it?



There has to be a better way... right?

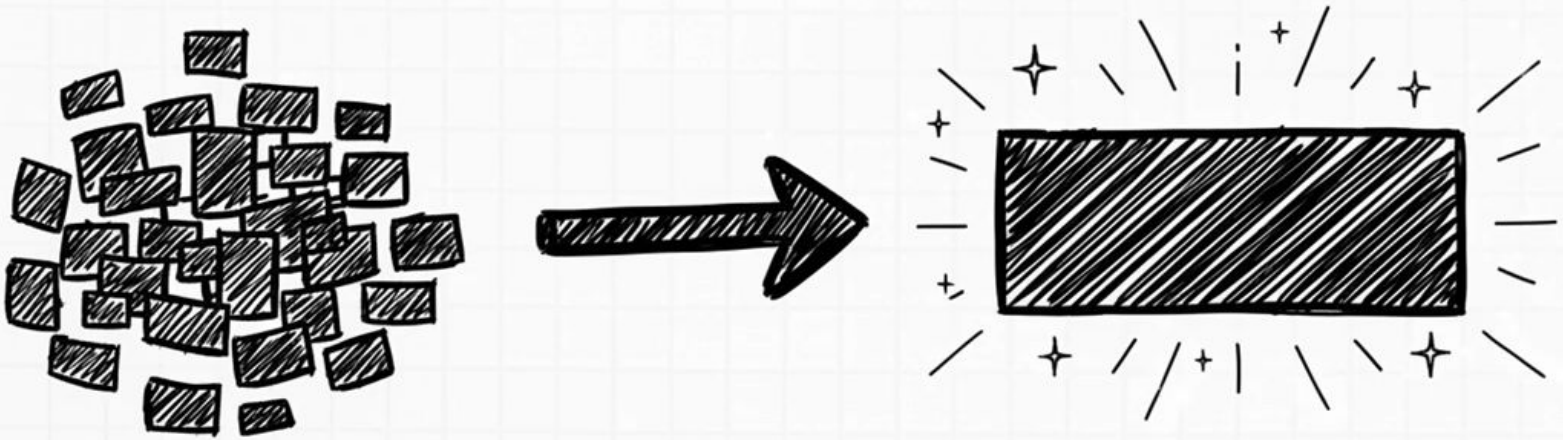


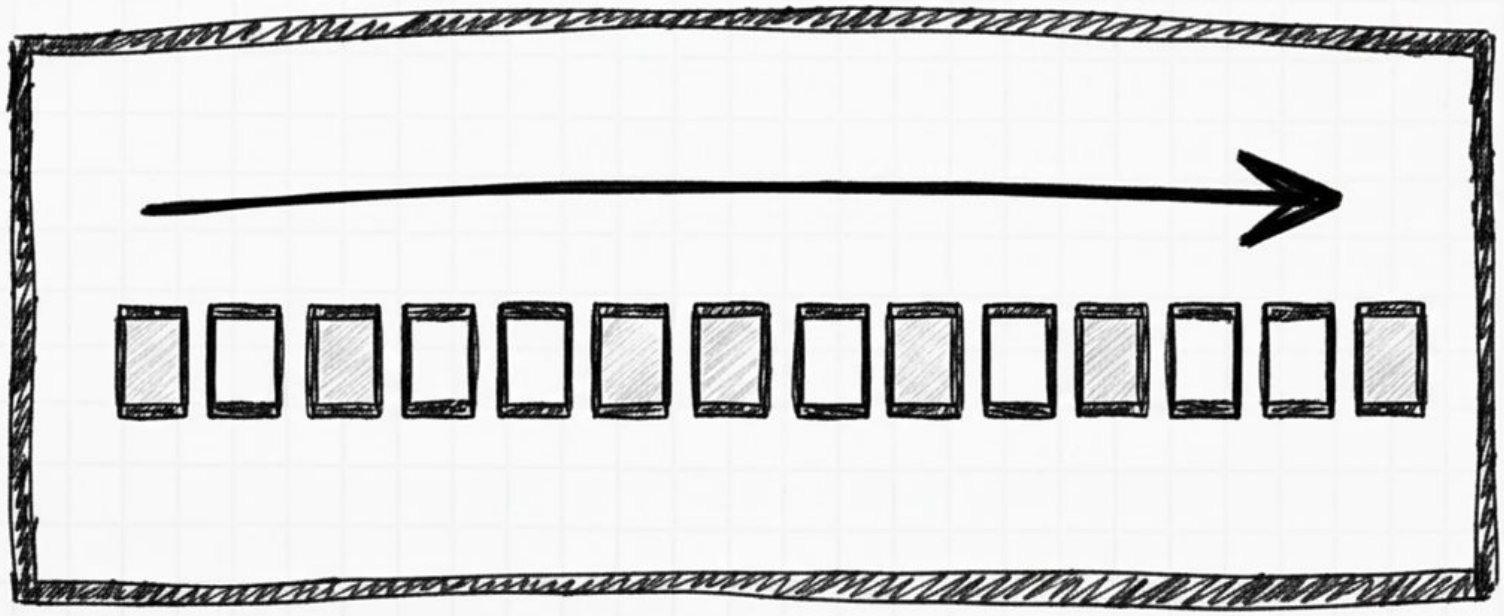

2
data overload
Arrays: The Tidy Solution
0 1
0 3
0 5
0 4
0 0 2

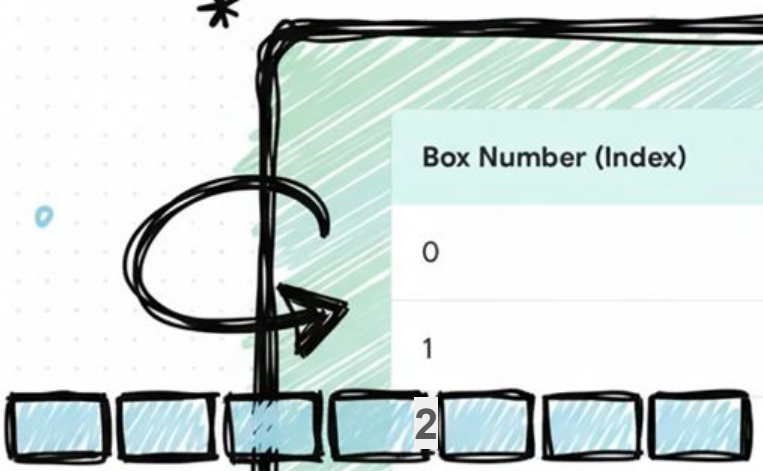


Array

A data structure to store multiple data items of the same type and access them using one name.



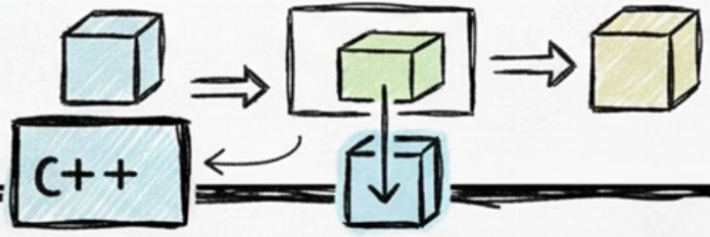




Box Number (Index)	Stored Value
0	score for student 1
1	score for student 2
2	score for student 3
...	...
49	score for student 50

Passing Parameters

Copies vs. Originals




3
Mastering Array
Essentials

Array Operations

1. Declare It

Create the array and specify its size.

2. Access It

Read or write a value in a specific 'box'.

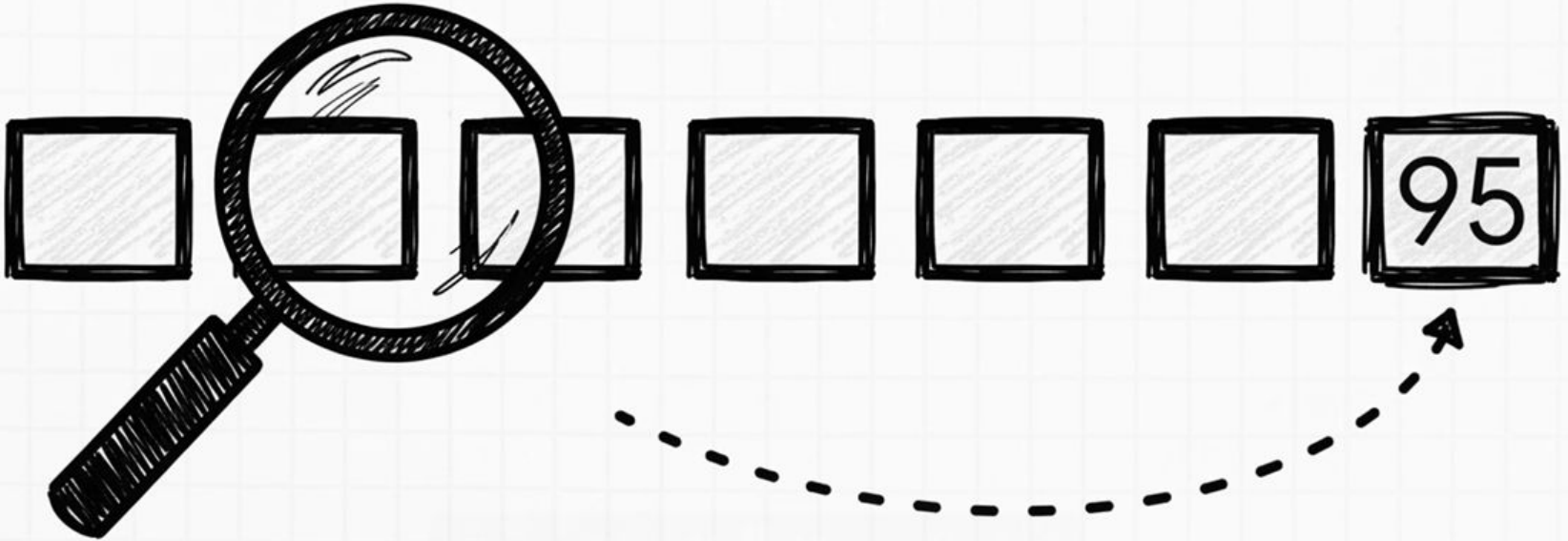
3. Loop It

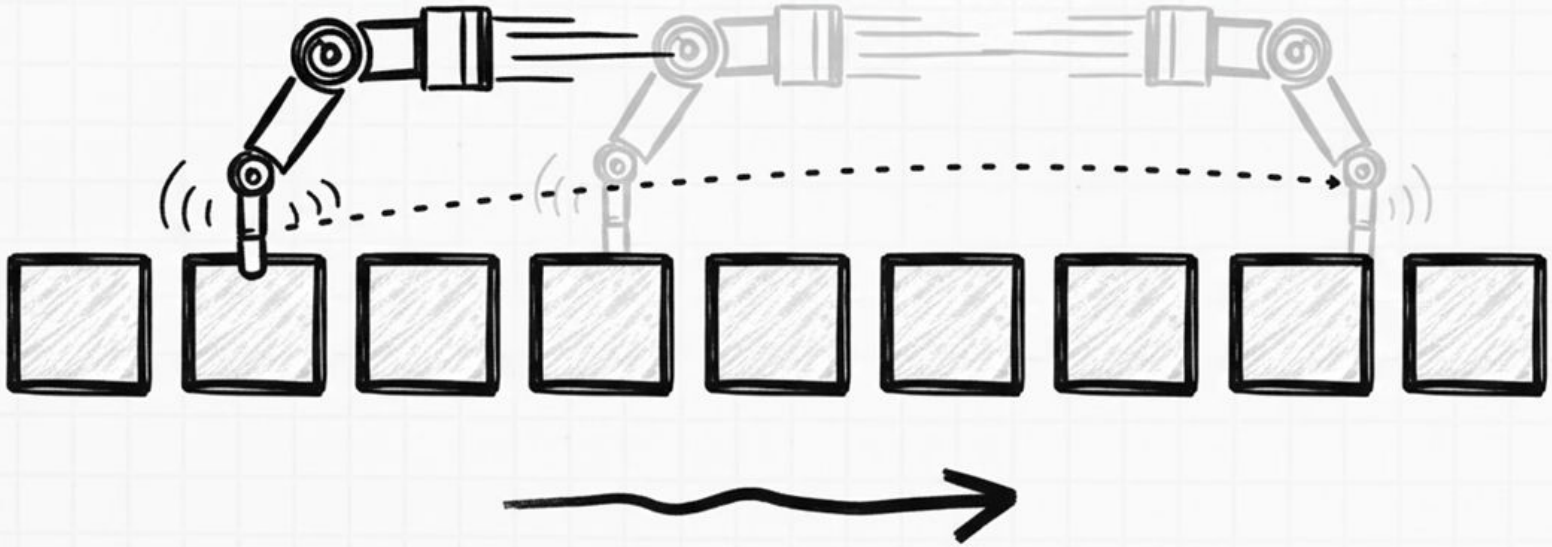
Process every element automatically.

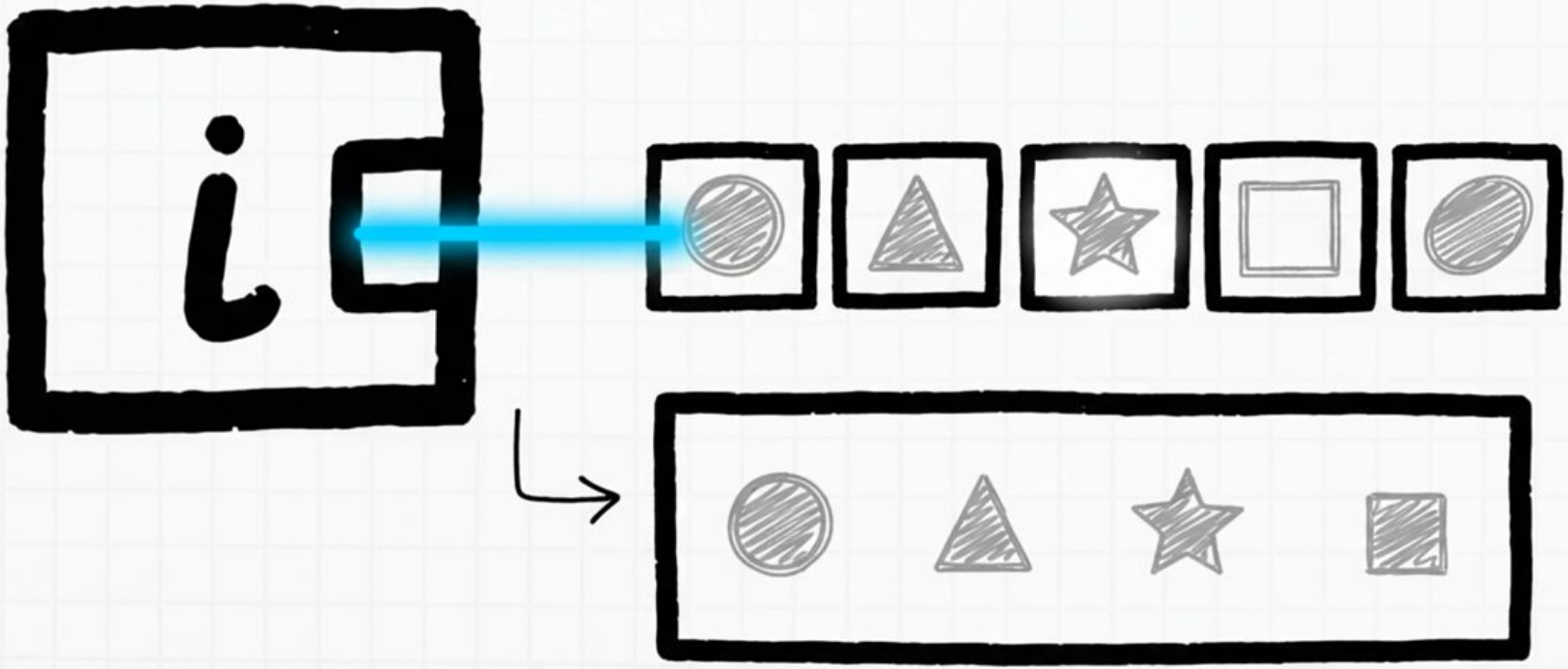
Follow the syntax: `dataType name[size];`. For example,

```
int scores[50];
```

```cpp
int numbers[5]; // Declares an array named 'numbers' that can hold 5

 char name[10] = "Example"; // Declares a char array and initializes

float temperatures[] = {25.5, 26.1, 24.9}; // Declares and initializes

  #include <string>

  std::string fruits[4]; // Declares an array named 'fruits'
```

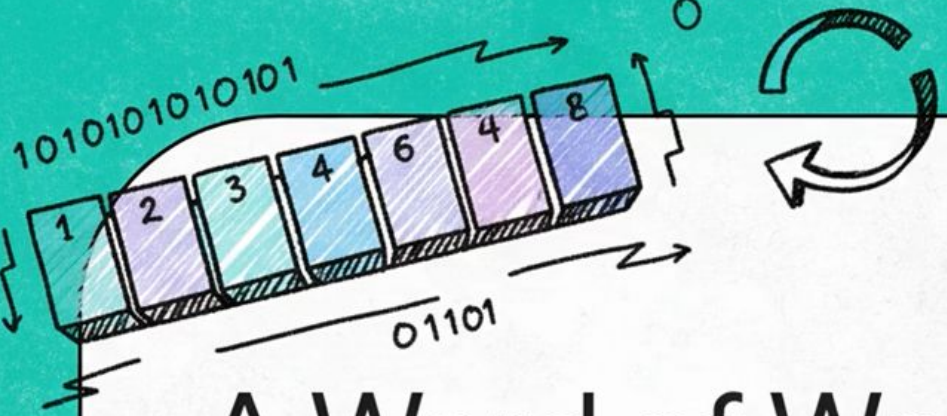

95





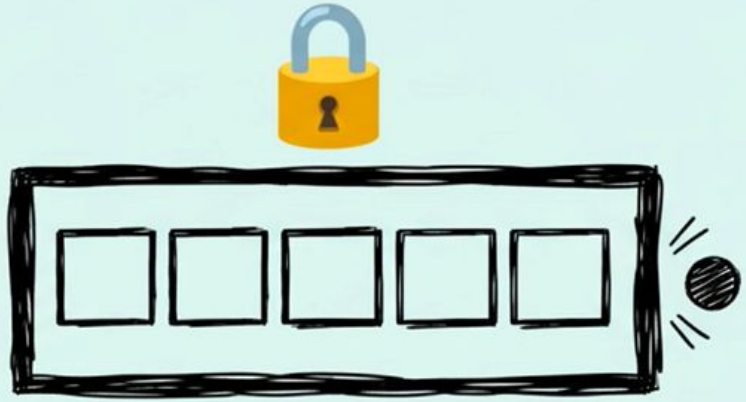
```
// Create an array of strings
string cars[5] = {"Volvo", "BMW", "Ford", "Mazda", "Tesla"};

// Loop through strings
for (int i = 0; i < 5; i++) {
  cout << cars[i] << "\n";
}
```

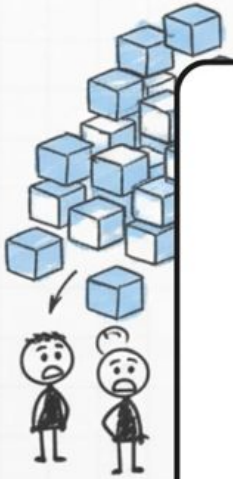
4



A Word of Warning

Efficient Access: Instantly get any element using its index.

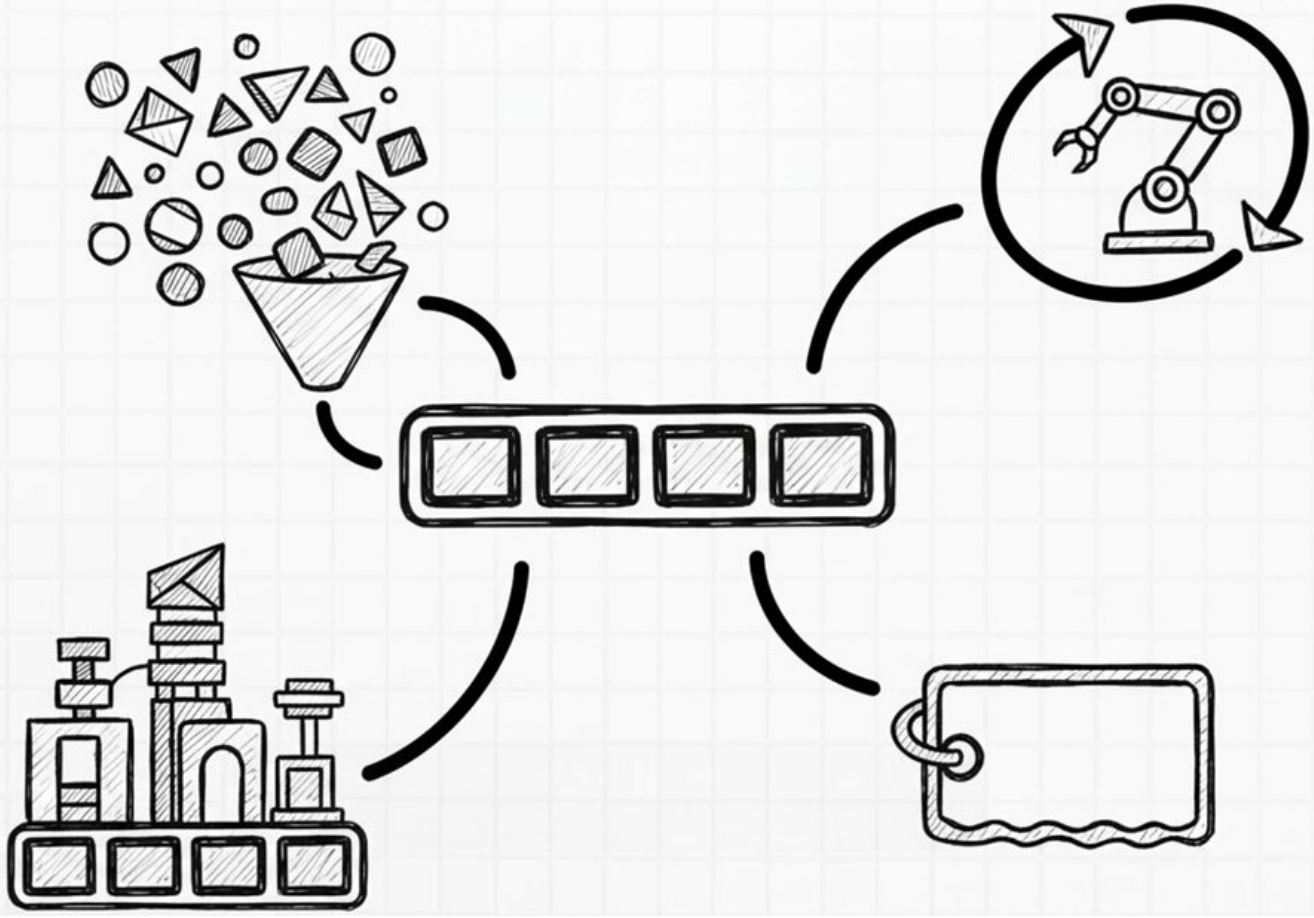


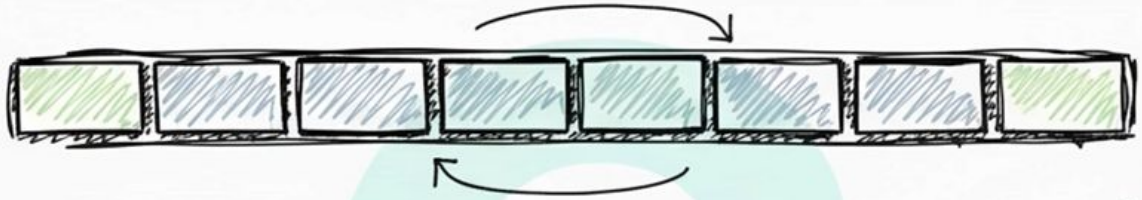


> If you try to access an array with outside the range of index, you will get an **error**. Index out of bounds.

CONS


5
Your New
Superpower





Now that you can handle lists of data, what problems will you solve?

Lab Assignment: MTA Train Stops

```
list
list mta_stops {

    Grand Central
    Times Sq-42 St,
    Times Sq- St,
    Penn Station
    W 4 St-Wash Sq,
    W 4 St-Wash Sq,

for {
    print(stops'stop))
}
```

Create an array (list) of train stops frour favorite MTA line and through each stop in a “for” loop

Attendance