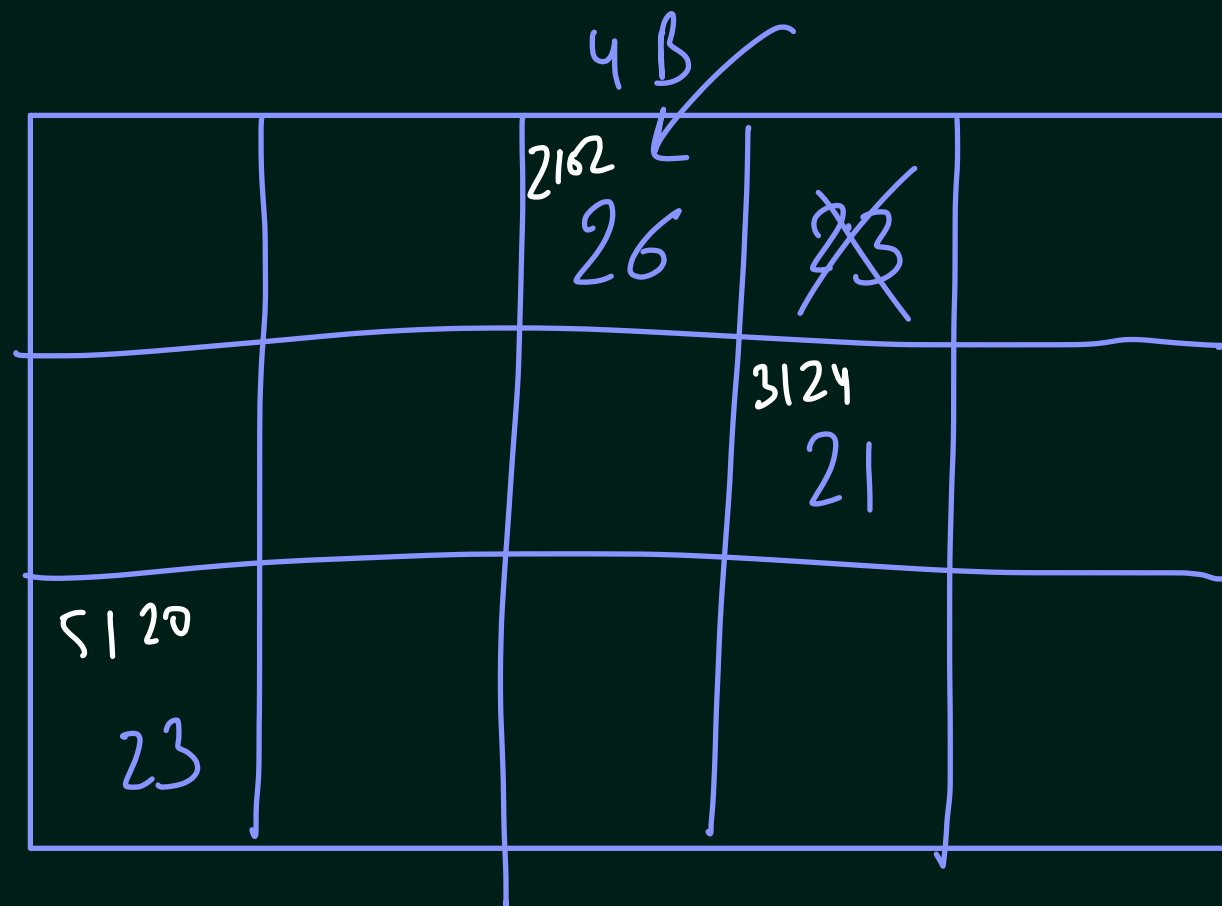# Arrays in Java

In This Lecture

1. How do the Arrays work?

2. Creating and Declaring Arrays

3. for-each loop

4. Multi-dimensional Arrays

How do the Arrays work?

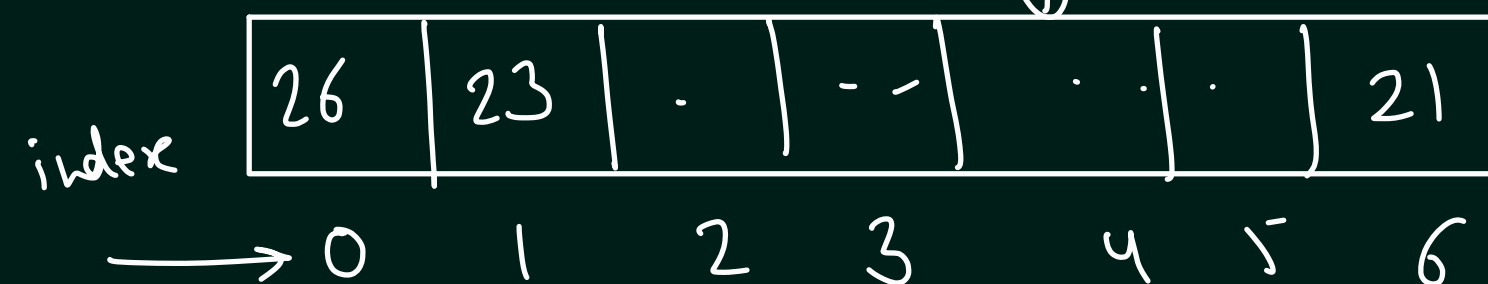Arrays are stored in contiguous memory [consecutive memory locations].

4 B

2162
26   23

3124
21

5120
23

$\rightarrow$ int age1 = 26;

$\rightarrow$ int age2 = 23;

...

int age10 = 21;

Arrays $\rightarrow$ Same Type data

length = 7

26	23	.	--	.	.	21

index

0   1   2   3   4   5   6

Creating an Array

// both are valid declarations

↳ int intArray[];

or int[] intArray;

↓

intArray = new int[20]; // allocating memory to array

↳ int age;   // Declaration

↳ age = 23;   // Initialisation

```
address of zero + index * size
```

↳ 2132 + 3 * 4

[2144]

2132   2136   2140   2144   2148

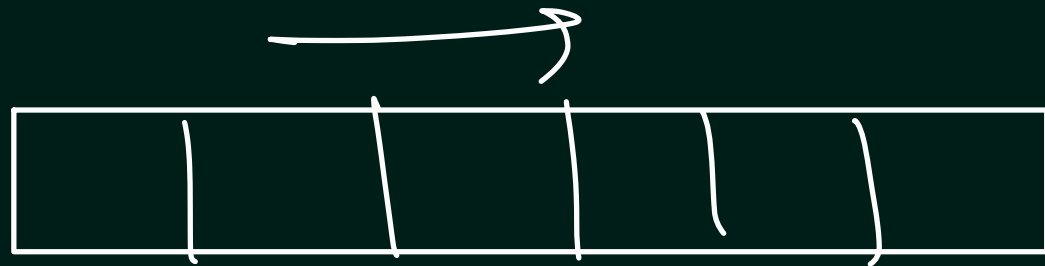| 5 | 2 | 12 | 23 | 16 |

length = 5

indexing

0   1   2   3   4

age
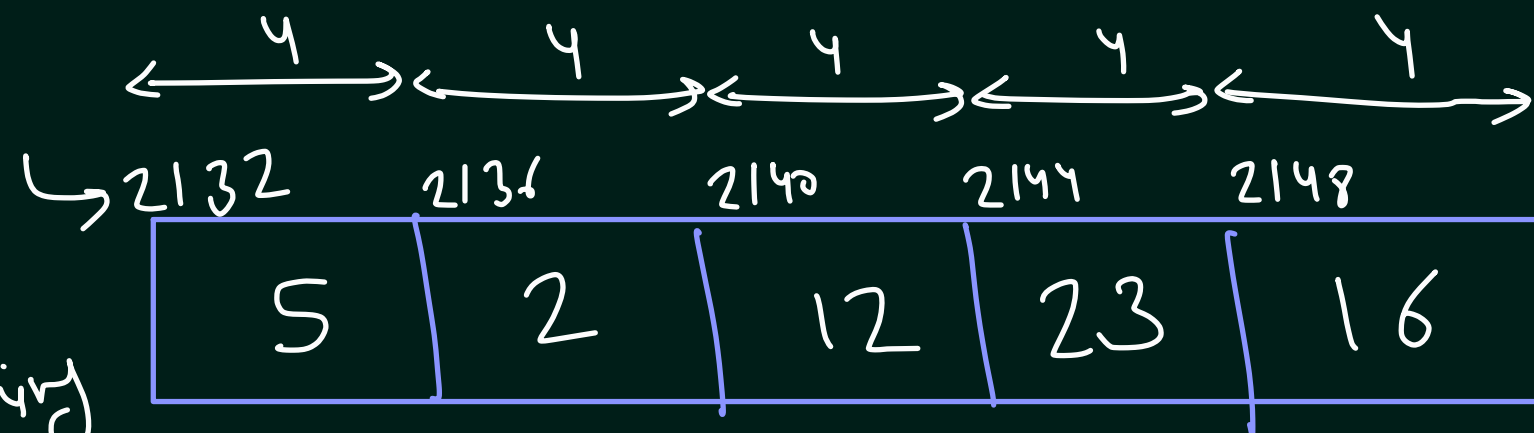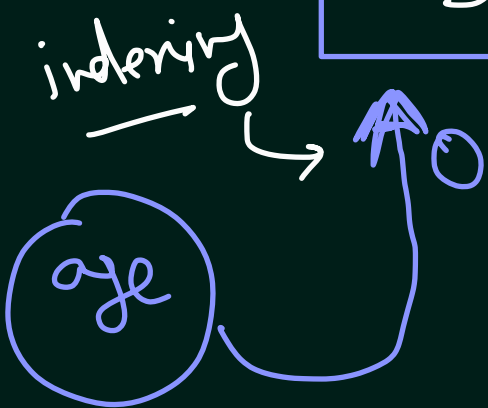
age[3] = 23;

for-each Loop

↳ Arrays

↳ for (Strig name : names) {

sout(name);

}

Multi-dimensional Array

2-D array / Matrix

int a[][] = new int[3][4]
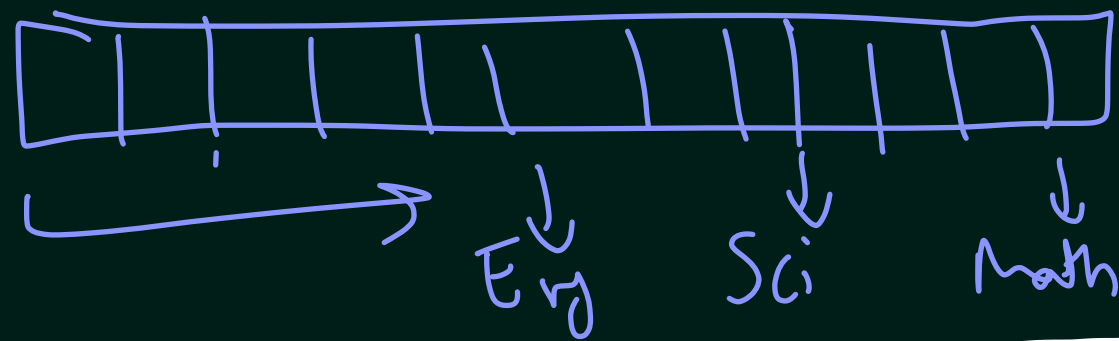
3 × 4 = 12

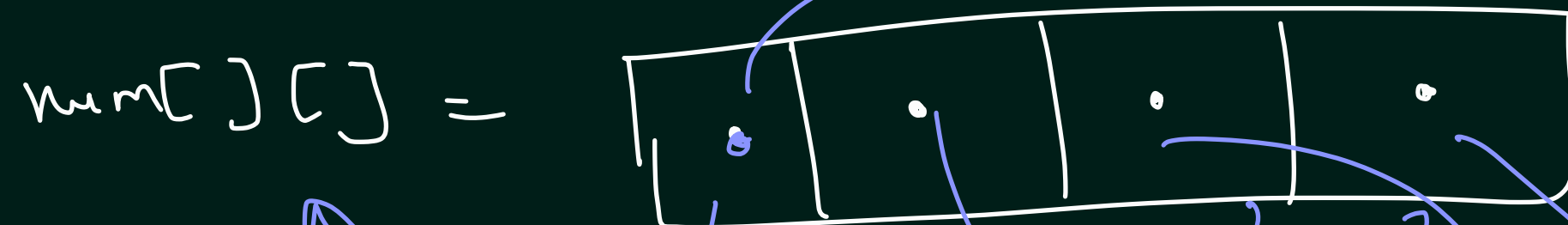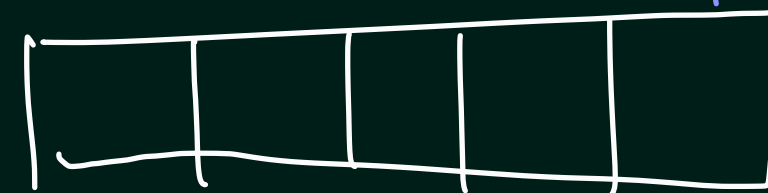|	Column 1 0	Column 2 1	Column 3 2	Column 4 3
Row 1 0	a[0][0]	a[0][1]	a[0][2]	a[0][3]
Row 2 1	a[1][0]	a[1][1]	a[1][2]	a[1][3]
Row 3 2	a[2][0]	a[2][1]	a[2][2]	a[2][3]

r   c

Eng   Sci   Math

0 →
42	12	98
98	14	22

1 →

2 →

num[] =

col → 0 1 2 3 4

num[][] =

row

0 1 2 3

1,2