2017-2018 Bahar Yarıyılı
Balıkesir Üniversitesi
Endüstri Mühendisliği Bölümü

EMT2226
Nesne Yönelimli Programlamaya Giriş
(Tek ve Çok Boyutlu Diziler, Dizilerde Arama)

3

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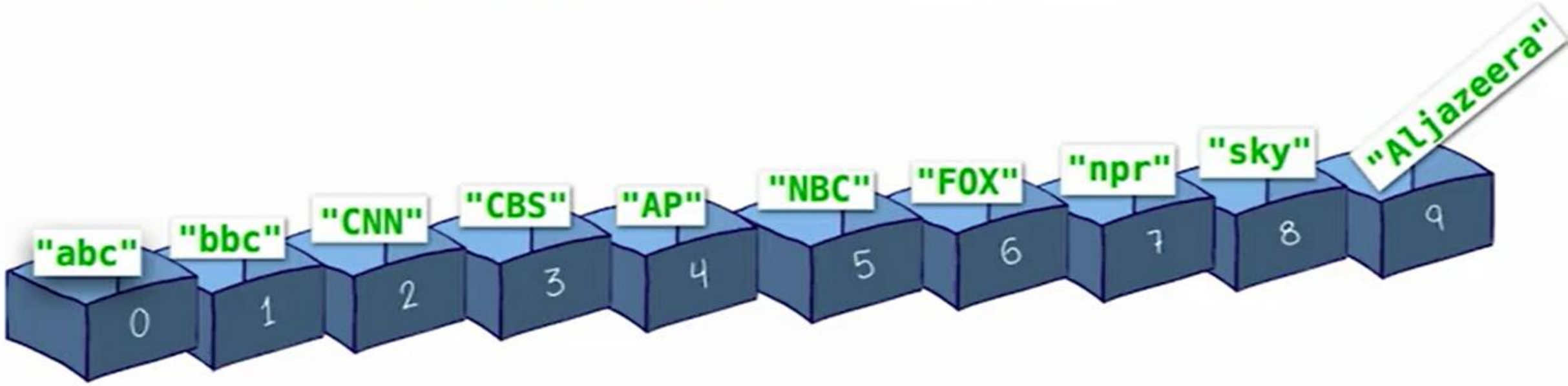
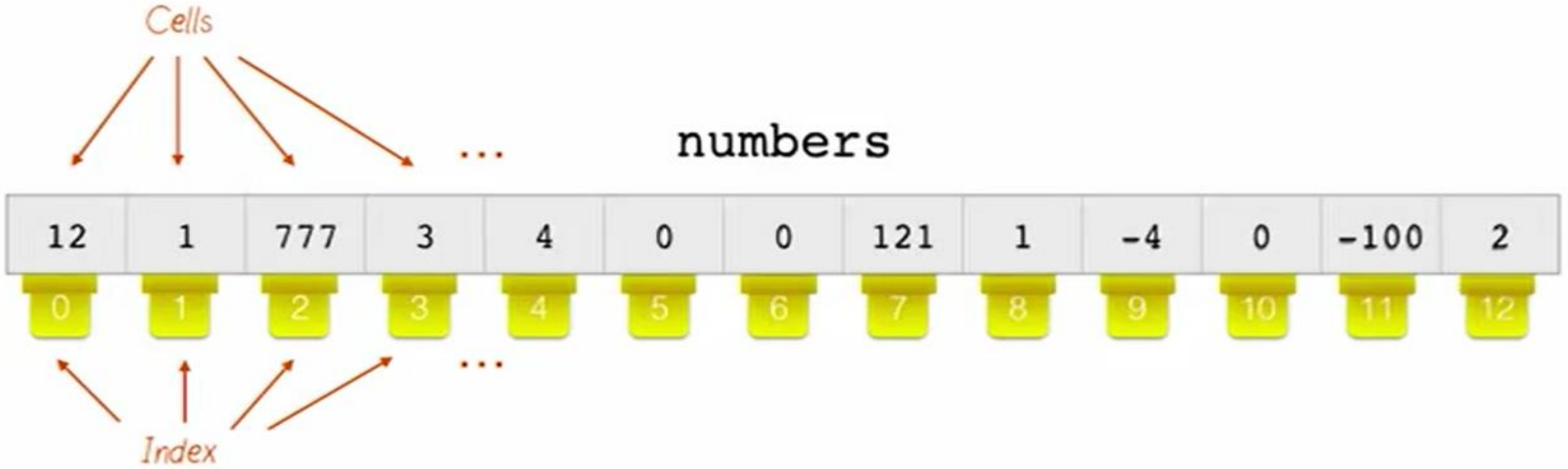
ARRAY OF STRINGS




```
newsOutlet

newsOutlet[0]  ⟶  "abc"
newsOutlet[1]  ⟶  "bbc"
newsOutlet[2]  ⟶  "CNN"
```

ARRAY OF INTEGERS




```
int sum = numbers[0]+numbers[3];
```

sum ⟶ 15

ARRAY OF INTEGERS

numbers


```
int [] numbers ={12,1,777,3,4,0,0,121,1,-4,0,-100,2};
System.out.print(numbers[0]);
System.out.print(numbers[9]*numbers[12]);
```

Print output

```
12
-8
```

ARRAY OF DOUBLES


```
double [] fracNumbers = {4.0, 6.2, 3.75, 5.1, 9.99};
```

Pick a random press

newsOutlet

0	"abc"
1	"bbc"
2	"CNN"
3	"CBS"
4	"AP"
5	"NBC"
6	"FOX"
7	"npr"
8	"sky"
9	"Aljazeera"

PRESS CONFERENCE

```
String [] newsOutlet = {"abc","bbc","CNN","CBS","AP","NBC","FOX","npr","sky","Aljazeera"};

double lucky = Math.random();

//Multiply by 10 to get a fractional number between 0 - 10
lucky *= 10;

//cast to integer to get an integer number between 0 - 9
int luckyIndex = (int) lucky;

System.out.print(newsOutlet[luckyIndex]);
```

lucky	lucky*10	luckyIndex	Print output
0.423	4.23	4	"AP"
0.987	9.87	9	"Aljazeera"
0.611	6.11	6	"FOX"
0.123	1.23	1	"bbc"

Arrays and Loops

```
public double calculateAverage(double [] temperatures){
    int size = temperatures.length;
    double total = 0;
    for(int i=0; i<size; i++){
        total += temperatures[i];
    }
    double average = total/size;
    return average;
}
```

Number of items in the array

loop counter: (0, 1, 2 ...)

Arrays and Loops

{75,73,72,80}

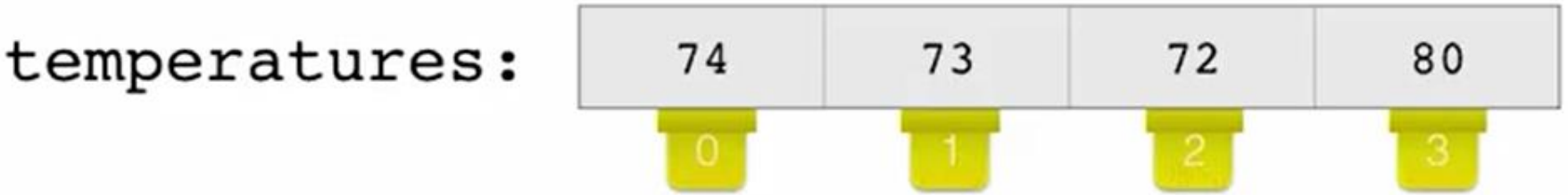
```
public double calculateAverage(double [] temperatures){
    int size = temperatures.length;
    double total = 0;
    for(int i=0; i<size; i++){
        total += temperatures[i];
    }
    double average = total/size;
    return average;
}
```

4

300 / 4 = 75

i	temperatures[i]	total
0	75	75
1	73	148
2	72	220
3	80	300
4		

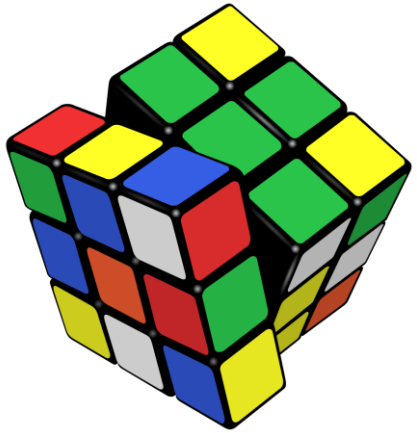
Array bounds




```
int size = temperatures.length;
```
← 4

```
System.out.println(temperatures[10]);
```
Error!

ArrayIndexOutOfBoundsException



Leaderboard	
Trish McCallister	7.85
Jayden McNeill	7.32
Lucas Etter	4.9
Michal Pleskowicz	6.22
Jiayu Wang	5.4
Kevin Costello	7.3
Pavan Ravindra	5.19

ARRAY SEARCH

```java
/**
 * Searches an array of speed
 * for the fastest (smallest) value.
 * @param speed array of speeds
 * @return double the fastest speed found
 */
public double search(double[] speed){
    int size = speed.length;
    double min = speed[0];
    for(int i=1 ; i<size ; i++){
       if(speed[i]<min){
           min = speed[i];
       }
    }
    return min;
}
```

STRING ARRAY SEARCH

Write a function that searches an array of Strings and finds the longest string

```
public String findLongestName(String [] names){

}
```

REMEMBER:

`name.length()` returns the length of a string

STRING ARRAY SEARCH

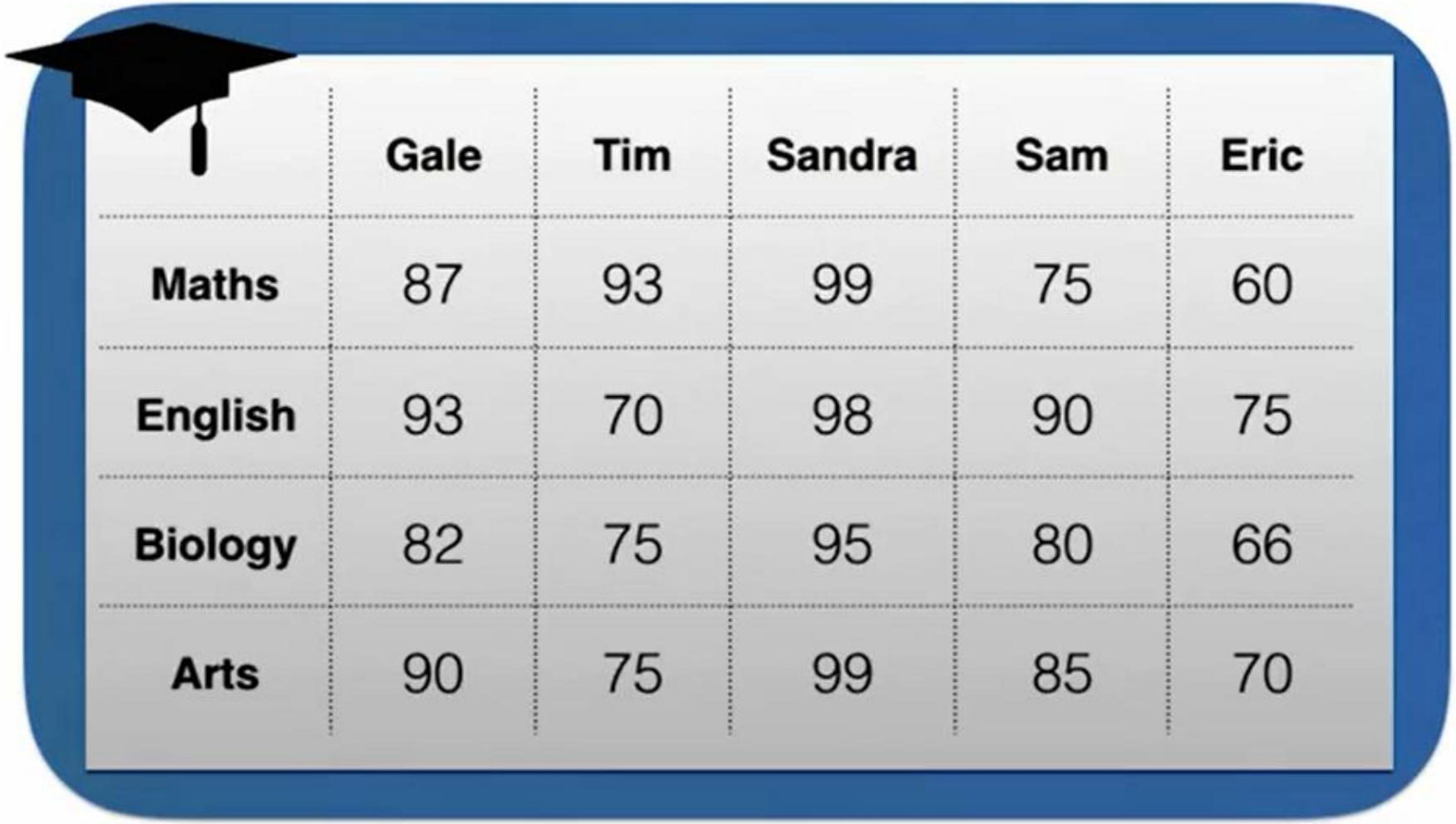
```java
/**
 * Searches an array of names
 * for the longest name.
 * @param names array of names
 * @return String: the longest name found
 */
public String findLongestName(String [] names){
   int size = names.length;
   String longestName = names[0];
   for(int i=1; i<size; i++){
     if(names[i].length() > longestName.length()){
         longestName = names[i];
     }
   }
   return longestName;
}
```

TIE BREAKERS ?

```java
public String findLongestName(String [] names){
    int size = names.length;
    String longestName = names[0];
    for(int i=1; i<size; i++){
        if(names[i].length() > longestName.length()){
            longestName = names[i];
        }
    }
    return longestName;
}
```

longestName ?

- "Kimberli"
- "Apolonia"
- Both of them
- None of them



	Gale	Tim	Sandra	Sam	Eric
Maths	87	93	99	75	60
English	93	70	98	90	75
Biology	82	75	95	80	66
Arts	90	75	99	85	70

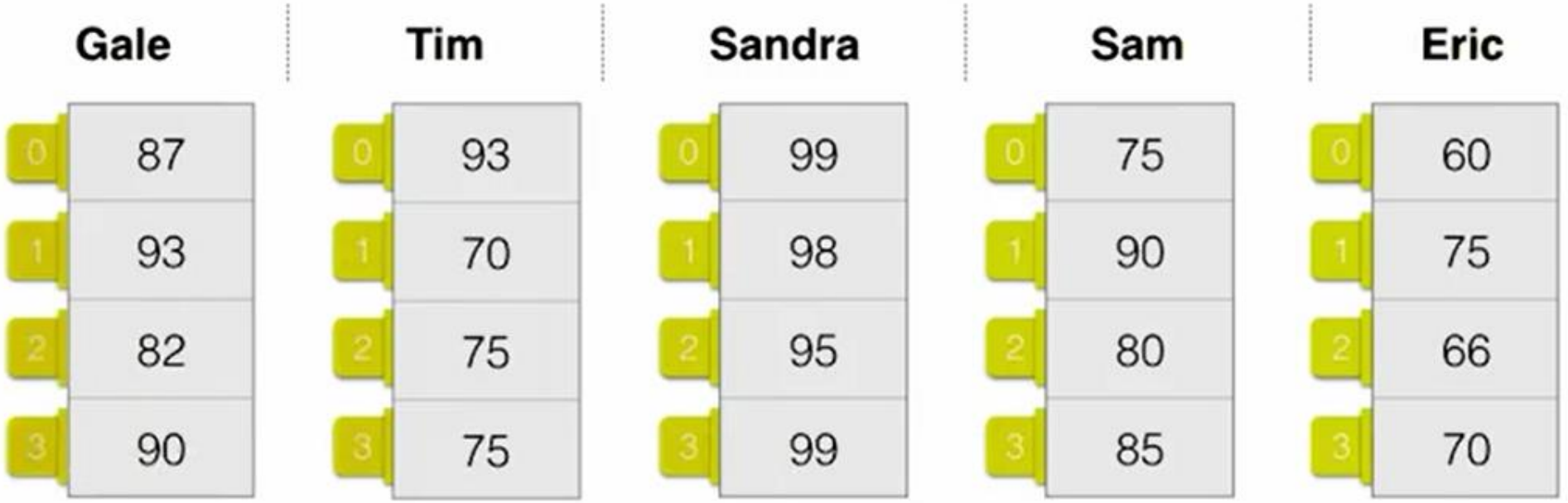
int []

4

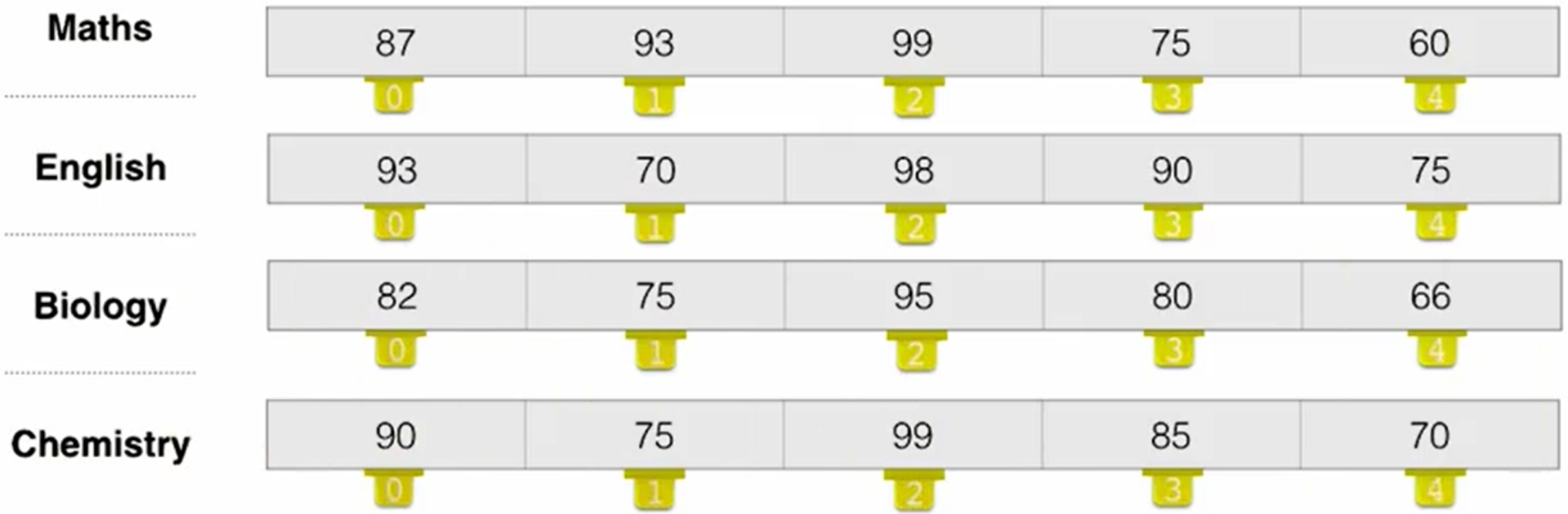
5

= 20 Grades

Array per student



Array per subject



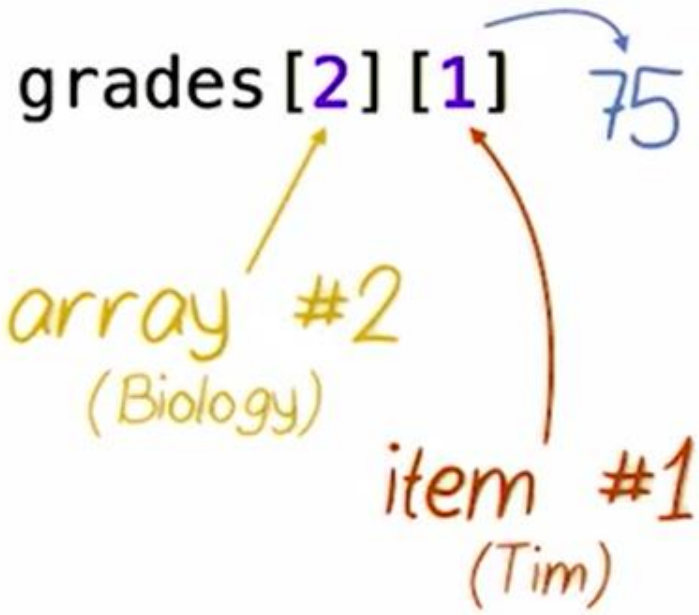
Looping over 2D Arrays


```
for(i=0; i<5; i++) {
    grades[1][i]
}
```

English

2D Array

	Gale (0)	Tim (1)	Sandra (2)	Sam (3)	Eric (4)
Maths (0)	87	93	99	75	60
English (1)	93	70	98	90	75
Biology (2)	82	75	95	80	66
Arts (3)	90	75	99	85	70



Looping over 2D Arrays

```
public static double englishAverage(int [][] grades){
    int total = 0;
    for(int i=0; i<5; i++) {
        total += grades[1][i];
    }
    double average = total/5.0;
    return average;
}
```

Loop over all students in the english array

```
grades[1][i]
```

English Every student

Looping over 2D Arrays

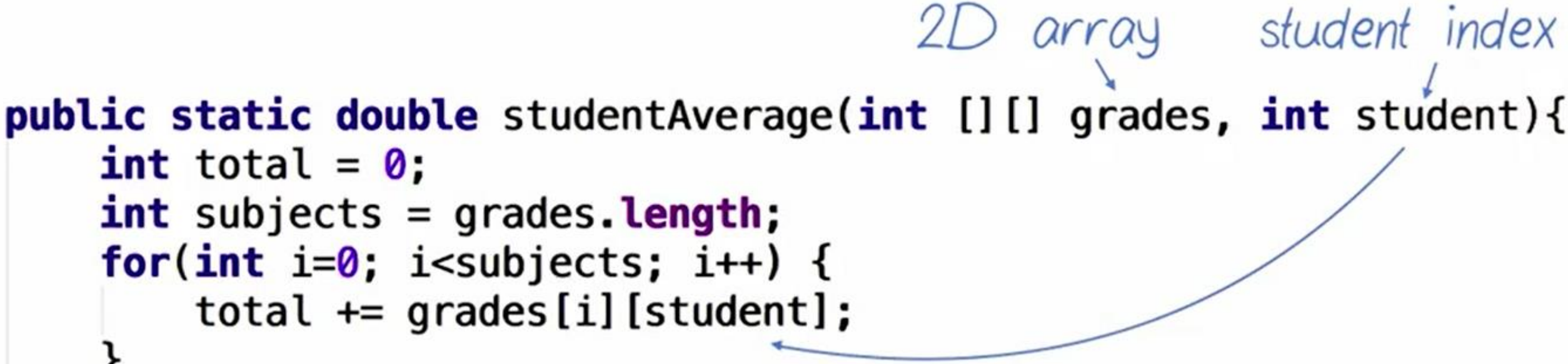
```
public static double sandraAverage(int [][] grades){
    int total = 0;
    for(int i=0; i<4; i++) {
        total += grades[i][2];
    }
    double average = total/4.0;
    return average;
}
```

Loop over all grades under Sandra

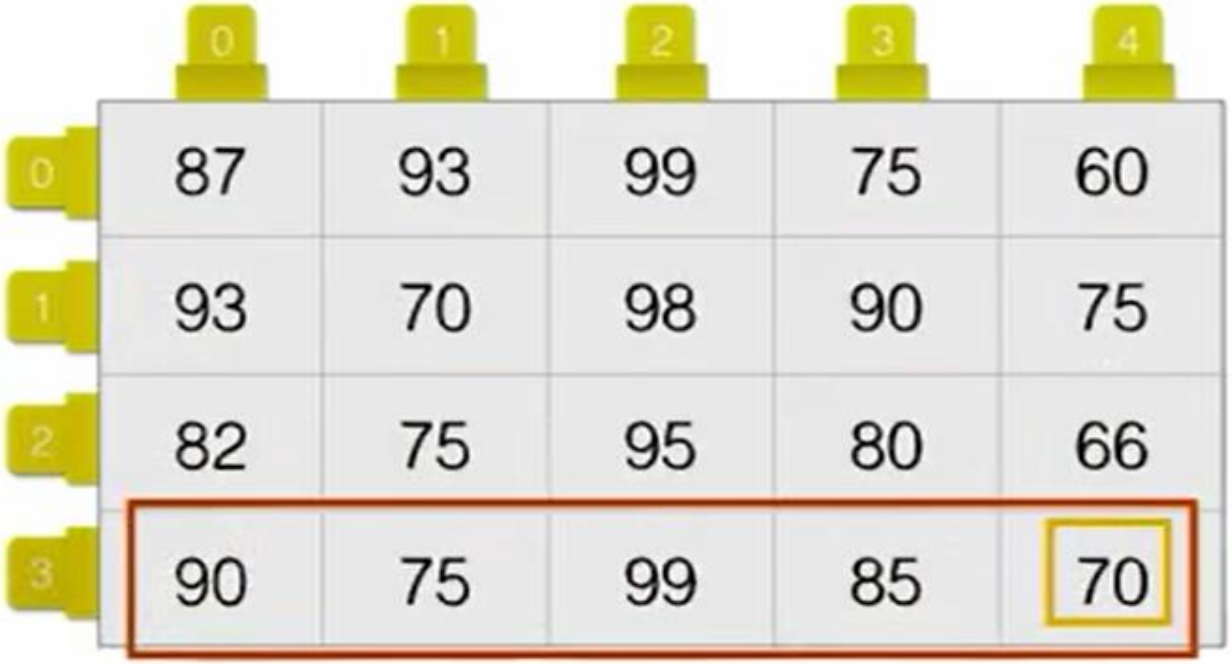
grades[i][2]

Every Subject Sandra

Looping over 2D Arrays



Nested loops with 2D arrays



	0	1	2	3	4
0	87	93	99	75	60
1	93	70	98	90	75
2	82	75	95	80	66
3	90	75	99	85	70

```
int total = 0;
for(int i=0; i<4; i++){
    for (int j=0; j<5; j++){
        total += grades[i][j];
    }
}
```

REFERENCES

- Udacity Java Programming Lectures, https://in.udacity.com/course/intro-to-java-programming--cs046