Multi-Dimensional Arrays in Java

CSCI 111

Birthdate Storage

Suppose we want to store people's birthdates (e.g. 10/22/1995)? How would we do that?

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Month	Day	Year
10	22	1995
3	4	1992
6	17	1990
12	9	1993

We make something we call a table (or matrix) that consists of multiple rows and columns. Each row corresponds to a person's full birthday and each column corresponds to either Months, Days, or Years.

Birthdate Storage

So, we have an array, where each element in the array (a person's birthday) consists of 3 pieces of information (Month, Day, Year).

Month	Day	Year
10	22	1995
3	4	1992
6	17	1990
12	9	1993

Month	Day	Year
10	22	1995
3	4	1992
6	17	1990
12	9	1993
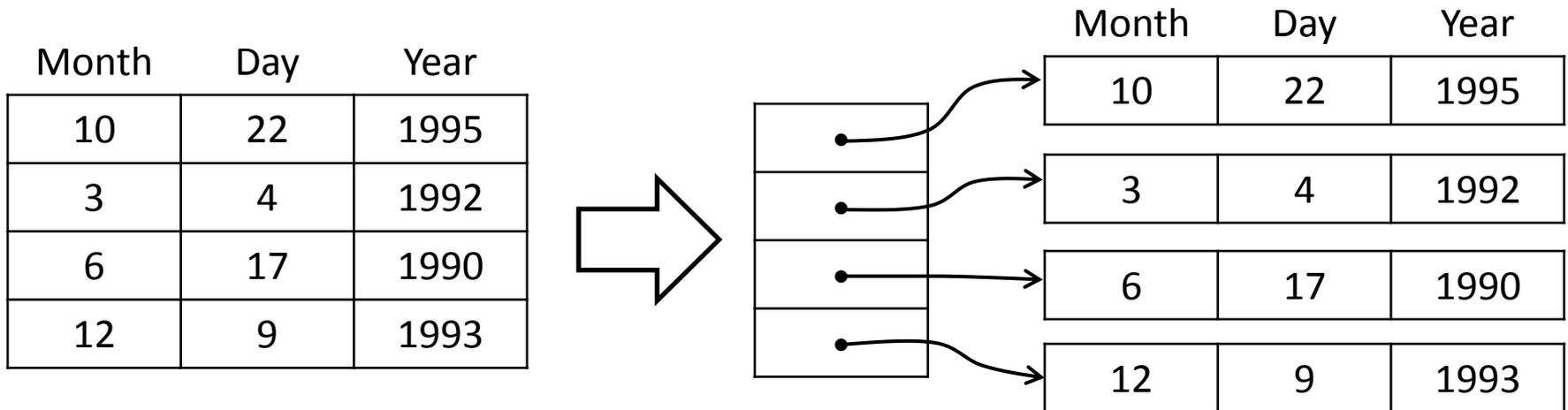
This is called a multi-dimension array
(2D array in this case)

Birthdate Storage
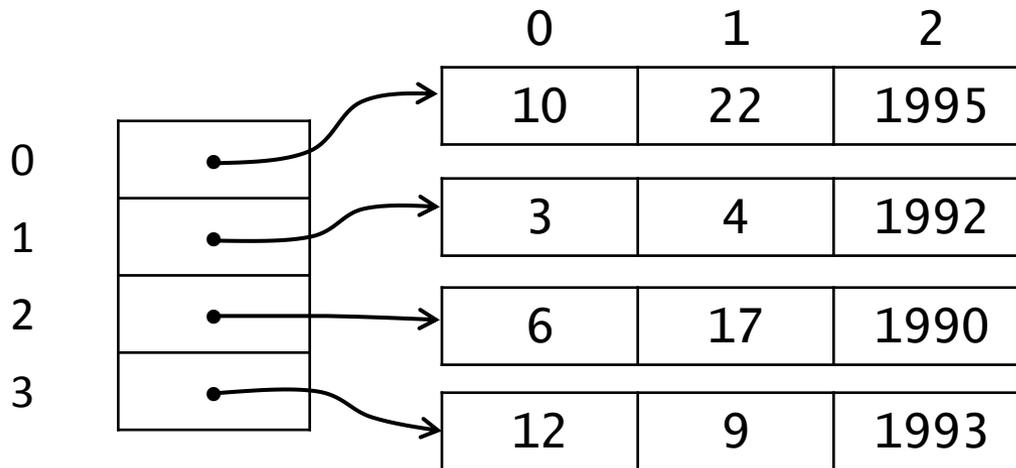
What year was person 2 born in?

Birthdate Storage
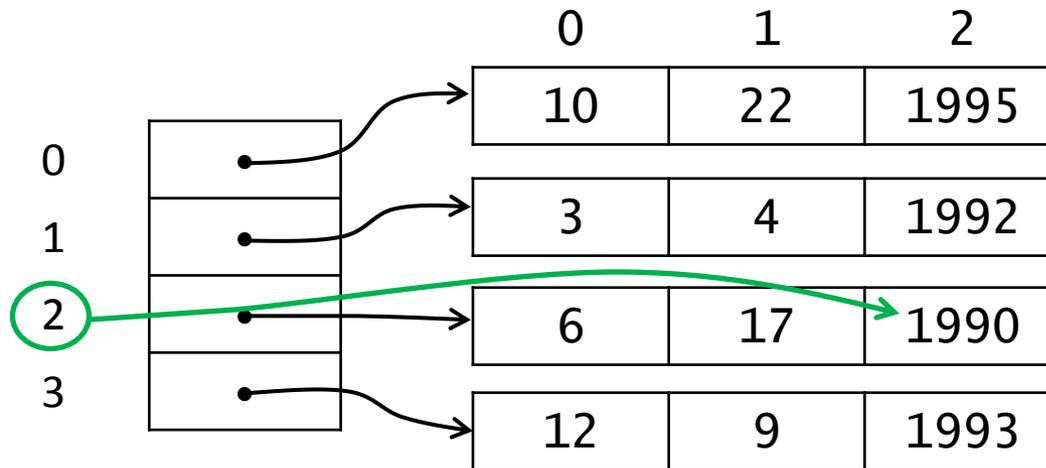
What year was person 2 born in?

1990

2D Array Manipulation

Code:

```
int[][] birthdays = new int[4][3];
```

2D Array Manipulation

	0	1	2
0	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0

Code:

```
int[][] birthdays = new int[4][3];
```

2D Array Manipulation

columns

	0	1	2
0	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0

rows

Code:

```
int[][] birthdays = new int[4][3];
```
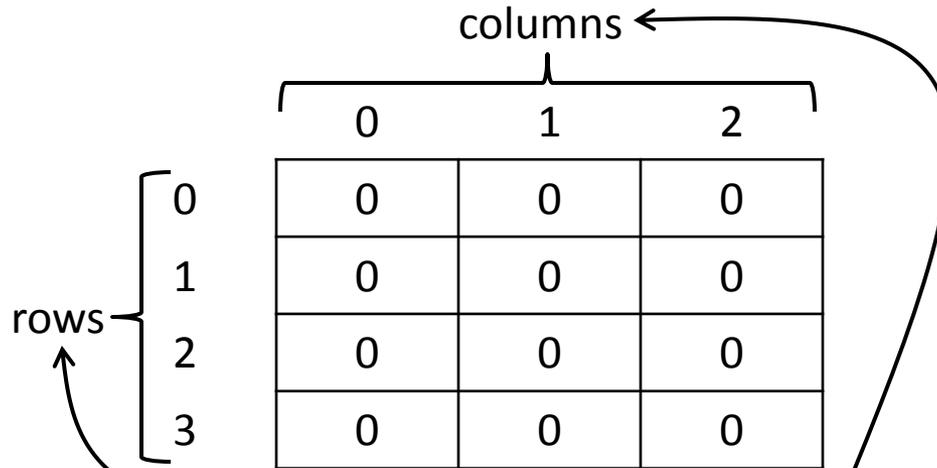
2D Array Manipulation

	0	1	2
0	10	0	0
1	0	0	0
2	0	0	0
3	0	0	0

Code:

```
int[][] birthdays = new int[4][3];
birthdays[0][0] = 10;
```

2D Array Manipulation

	0	1	2
0	10	22	0
1	0	0	0
2	0	0	0
3	0	0	0

Code:

```
int[][] birthdays = new int[4][3];
birthdays[0][0] = 10;
birthdays[0][1] = 22;
```

2D Array Manipulation

	0	1	2
0	10	22	1995
1	3	4	1992
2	6	17	1990
3	12	9	1993

Code:

```
int[][] birthdays = new int[4][3];
birthdays[0][0] = 10;
birthdays[0][1] = 22;
…
birthdays[3][2] = 1993;
```

2D Array Manipulation

	0	1	2
0	10	22	1995
1	3	4	1992
2	6	17	1990
3	12	9	1993

Code:

```
int[][] birthdays = new int[4][3];
birthdays[0][0] = 10;
birthdays[0][1] = 22;
…
birthdays[3][2] = 1993;
System.out.println(birthdays.length);  //prints 4
```

2D Array Manipulation

	0	1	2
0	10	22	1995
1	3	4	1992
2	6	17	1990
3	12	9	1993

Code:

```
int[][] birthdays = new int[4][3];
birthdays[0][0] = 10;
birthdays[0][1] = 22;
…
birthdays[3][2] = 1993;
System.out.println(birthdays.length);  //prints 4
System.out.println(birthdays[0].length);  //prints 3
```