# Chapter 5: Arrays

# Motivating Examples

- How would you write a program that had to store 3 integers?

- How about 100 integers?

- An array is used to store multiple elements (values) of the same type

- An array can be of any type (int, double, String, etc), but all elements must be the same type

- An array can be thought of as a list of *variables*, which are sometimes referred to as *indexed variables*

- The index starts at zero!

# Array declaration and initialization

- int [] arr = new int[4]; // an array of size 4

  arr[0] = 2;

  arr[1] = 10;

  arr[2] = 1;

  arr[3] = 0;

Size of array in brackets in declaration

| Element # | Value | Variable |
|-----------|-------|----------|
| 1 | arr[0] | 2 |
| 2 | arr[1] | 10 |
| 3 | arr[2] | 1 |
| 4 | arr[3] | 0 |

- Alternatively,

  int [] arr = {2,10,1,0};

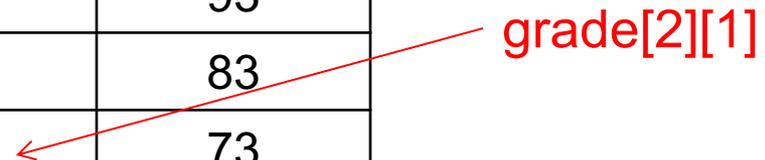After declaration, the brackets contain the index (or subscript)

# 2-dimensional arrays

- int [][] x = new int[4][3]; // declaration only

# of rows          # of columns

- See *twoDimensionalArray.java* example

|  | Column index 0 | Column index 1 | Column index 2 |
|---|---|---|---|
| Row index 0 | 91 | 92 | 93 |
| Row index 1 | 81 | 82 | 83 |
| Row index 2 | 71 | 72 | 73 |
| Row index 3 | 74 | 75 | 76 |

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