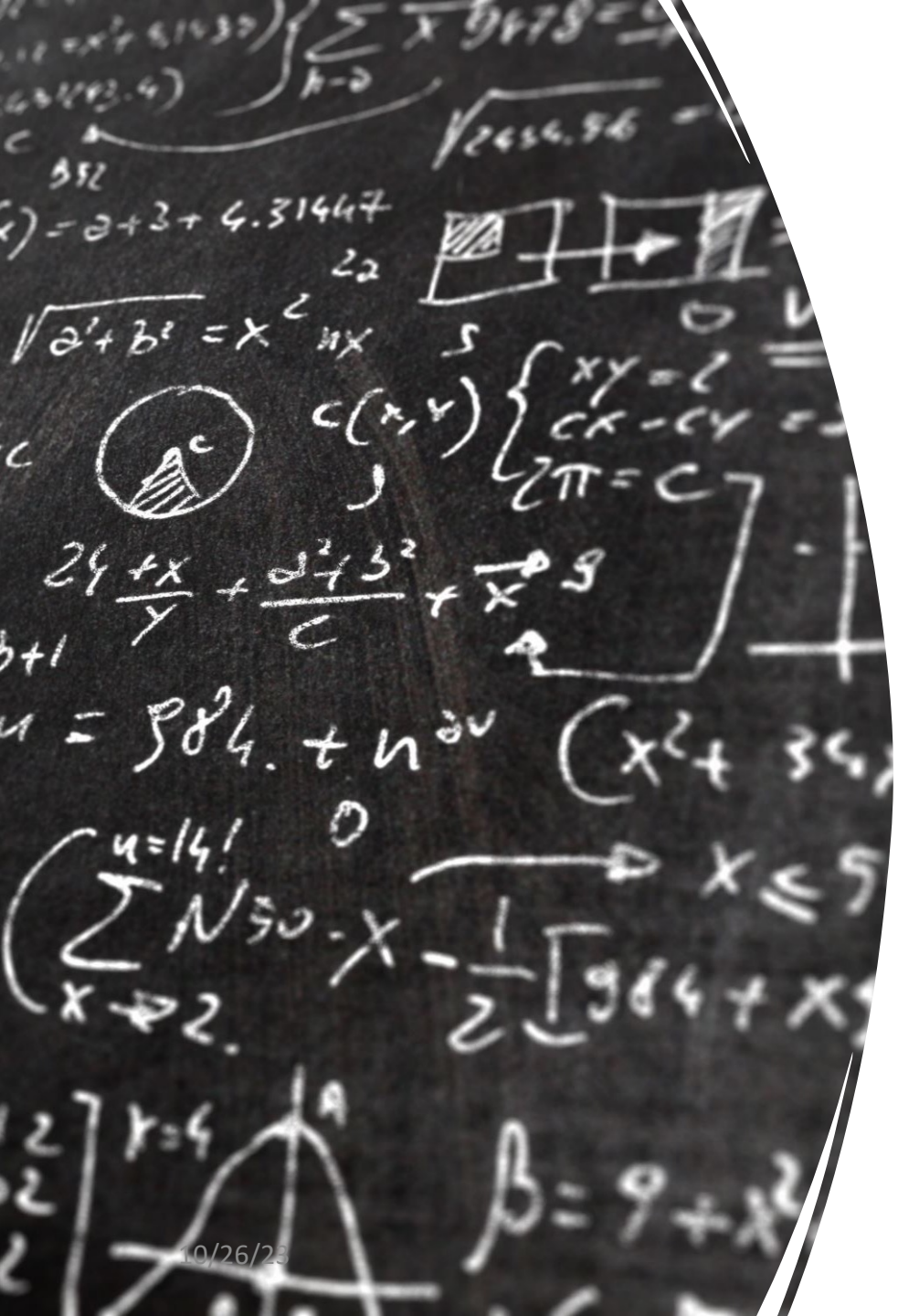

CS 113 – Computer Science I

Lecture 14 – Loops & Arrays

Thursday 10/26/2023

Announcements

- HW 05 – Due Monday 10/30
  - Implement Blackjack!
  - Paired assignment – can work with a partner

- Midterm 1:
  - Grades returned

Agenda

- Announcements
- **Loops**
- Arrays of Arrays

Iterating through an array

Write a method called printArray that takes in an array of integers and prints out the values in each array:

printArray({1,2,3,4}) -> “1 2 3 4”

Exercise: Nested loops

```
$ java Square
Enter a size: 5
*****
*****
*****
*****
*****

$ java Square
Enter a size: 1
*

$ java Square
Enter a size: 0
```

While vs For loop

Use a for loop when we know the number of iterations we want

Use a while loop when we don’t know the number of iterations before hand

Agenda

- Announcements
- While Loops
- For Loops
- **Arrays of Arrays**

Arrays of Arrays

int[] array1 is an array of ints

String[] array2 is an array of Strings

What is int[][] array3?

An array of integer arrays

What is String[][] array4?

An array of String arrays

2D array example

What does int[][] array = new int[4][3] look like?

2D array example

What does int[][] array = new int[4][3] look like?

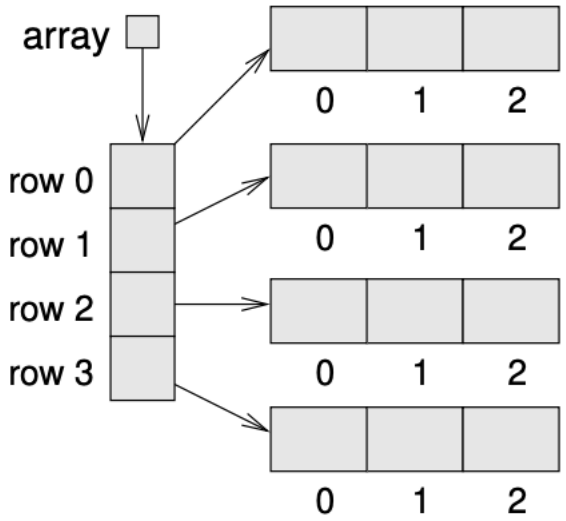

Figure 15.3: Storing rows and columns with a 2D array.

2D Array

Useful for representing a:

- Grid
- Boardgame
- Matrix
- Table
- …

Traversing through a 2D array

What type of loop should we use?

if we know the length, then a for loop

Pseudocode/algorithm:

```
for array in 2D array:
    for item in array:
```

Array Example

Given a square array, compute the sum of the diagonal

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	23	25

Array Example

Given a square 2-D array, compute the sum of the diagonal

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	23	25

Array Example

Given a 2-D array, compute the sum of the perimeter

1	2	3	4	5	2	2
6	7	8	9	10	3	6
11	12	13	14	15	1	6
16	17	18	19	20	9	8

Array Example

Given a 2-D array, compute the sum of the perimeter

1	2	3	4	5	2	2
6	7	8	9	10	3	6
11	12	13	14	15	1	6
16	17	18	19	20	9	8