

LEC 16

CSE 121

Array Patterns

Questions during Class?

Raise hand or send here

sli.do #cse121



BEFORE WE START

Talk to your neighbors:

*What's your favorite
Thanksgiving/fall food?*

Music:  [CSE 121 25au Lecture Tunes](#) 

Instructors: Brett Wortzman & James Weichert

TAs:	Trey	Ava	Caleb	Elden	Anya
	Amogh	Reese	Anum	Suyash	Minh
	Samrutha	Hayden	Abdul	Sthiti	TJ
	Dalton	Aki	Janvi	Paul	Zach
	Ailsa	Spencer	Navya	Shayna	Cayden
	Ryan	Savannah	Sam	Jesse	Johnathan
	Anant	Tamsyn	Jessica	Nhan	

Announcements, Reminders

- Quiz 2 in section **tomorrow (Thursday, November 20th)!**
 - Reference sheet and practice quizzes on Ed
 - Email us ahead of time if you need to request a makeup
- P3 will be released tonight & due **Tuesday, December 2nd at 11:59pm**
- R5 due tomorrow (eligible: P1, C2, P2)
 - P1 cycling out of eligibility after R5
- Final Exam on **Wednesday, December 10th, 12:30-2:20pm**
 - Left-handed desk request form out next week
 - More details posted soon, and will be discussed on Friday

(PCM) Why Discuss Array Patterns?

- Arrays are important! This is our fourth lecture covering arrays
- Analogy: tools in toolbox
- Helpful for your future in programming

(PCM) Counting Elements that Meet a Condition

"one"	"two"	"three"	"six"	"seven"	"eight"	"ten"
-------	-------	---------	-------	---------	---------	-------

```
public static int evenLength(String[] list) {  
    int countEven = 0;  
    for (int i = 0; i < list.length; i++) {  
        if (  
            countEven++;  
        }  
    }  
  
    return countEven;  
}
```

(PCM) Modifying Elements of an Array

4	8	15	16	23	42
---	---	----	----	----	----

```
public static void clamp(int min, int max, int[] list) {  
    for (int i = 0; i < list.length; i++) {  
        if (            > max) {  
            = max;  
        } else if (            < min) {  
            = min;  
        }  
    }  
}
```

(PCM) Searching for an Element

"one"	"two"	"three"	"six"	"seven"	"eight"	"ten"
-------	-------	---------	-------	---------	---------	-------

```
public static int indexOfIgnoreCase(String phrase, String[] list) {  
    for (int i = 0; i < list.length; i++) {  
        if (  
            return i;  
        }  
    }  
  
    return -1;  
}
```

(PCM) Array of Counters



0 1 2 2 0 2

```
public static int[] numCount(Scanner input, int numPrompts) {  
    int[] counts =  
        ;  
    for (int i = 0; i < numPrompts; i++) {  
        int num = input.nextInt();  
  
        ;  
    }  
  
    return counts;  
}
```

(PCM) Analyzing Multiple Elements in an Array (isPalindrome)

0	1	9	1	0
---	---	---	---	---

```
public static boolean isPalindrome(int[] list) {  
    for (int i = 0; i < list.length / 2; i++) {  
        if (list[i] != list[list.length - 1 - i]) {  
            return false;  
        }  
    }  
  
    return true;  
}
```

(PCM) Analyzing Multiple Elements in an Array (isMirrored)

0	1	9	1	0
---	---	---	---	---

```
public static boolean isMirrored(double[][] arr) {  
    for (int i = 0; i < arr.length; i++) {  
        int rowLength =  
        for (int j = 0; j <  
            if (arr[i][j] != arr[i][rowLength - 1 - j]) {  
                return  
            }  
        }  
    }  
    return  
}
```

(PCM) Shifting Elements

9.6	-88.0	4.815	0.009	7.0184	42.9
-----	-------	-------	-------	--------	------

```
public static void rotateRight(double[] list) {  
    double lastElement = list[list.length - 1];  
  
    for (int i = list.length - 1; i > 0; i--) {  
        list[i] = list[i - 1];  
    }  
  
    ;  
  
}
```

(PCM) Your Turn!

- Review the problems in the Array Patterns PCM
 - On Slido, vote for any problems you would like to go over together!
- If you have time, try some new problems!
 - [NEW] rotateLeft: Shifting Elements problem
 - [NEW] isAllPairs: Analyzing Multiple Elements problem
 - [NEW] transpose: 2D Analyzing Multiple Elements/Shifting Elements problem



(PCM) Questions to Ask Ourselves

- “Are we looking at each element in the array, one at a time?”
 - Loop traversal
- “Are we changing elements in the array?”
 - Update the array at a specific index
- “Do we only want to do a task if a certain condition is true?”
 - Conditional(s)