

The background of the slide is a grayscale image of a circuit board. It features a complex network of black lines representing traces and several solid black circles representing vias or components. The circuitry is arranged in a somewhat symmetrical, horizontal pattern. A solid black horizontal band runs across the middle of the image, partially obscuring the circuit board design. Below this band, the text 'CMSC 131' is displayed in a large, white, sans-serif font. Underneath the course number, the text 'Fall 2018' is written in a smaller, green, monospace-style font.

CMSC 131

Fall 2018

Announcements

- Median exam score was 75
- ADS exams are with me (see me after class)
- Project #6 is due Thursday
 - Regarding equals for the Entree class... Do it the old (wrong) way:
public boolean equals(Entree x) {...}

For-Each Loops

Assume `x` is a collection of `Cat` references
(Could be an array, `ArrayList`, any Java Collection...)

Instead of these:

```
for (i = 0; i < a.length; i++) {  
    ... a[i] ...  
}
```

```
for (i = 0; i < x.size(); i++) {  
    ... c.get(i)...  
}
```

Use this:

```
for (Cat c : x) {  
    ... c ...  
}
```

Example: `ForEachExample.java`, `ForEachWithTwoDimensionalArray.java`

Limitations of For-Each Loops

- Can't Loop through part of the list
- No index number
- Example: `DoesNotWorkWithForEachLoop.java`
- You cannot add or remove elements from the current list during the loop
Example: `DoNotTryRemoveInsideForEachLoop`

Choosing Algorithms

- What is an algorithm?
- What factors do we consider when choosing?
 - Familiar design
 - Ease of coding
 - Efficiency
 - Runtime
 - Memory

Algorithmic Complexity

- Fact: The more data we process the longer it takes
- Question: Is the processing time always *proportional* to the size of the data set?
- How can we classify algorithms with regard to this?
- Let's draw some graphs!

Linear Search

- Demonstration: Linear Search
- What shape will the runtime graph be?
- Roughly speaking, what happens to the runtime as the size of the dataset doubles?
- We classify *all* algorithms with this shape as “linear” algorithms.