CSE 121 Lesson 9:

Conditionals

Elba Garza & Matt Wang

Winter 2024

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TAs:	Abby	Aishah	Anju	Annie	Archit	Ayesha	Christian
	Hannah	Heather	Hibbah	Jacob	James	Janvi	Jasmine
	Jonus	Julia	Lucas	Luke	Maria	Nicole	Shananda
	Shayna	Trey	Vidhi	Vivian			

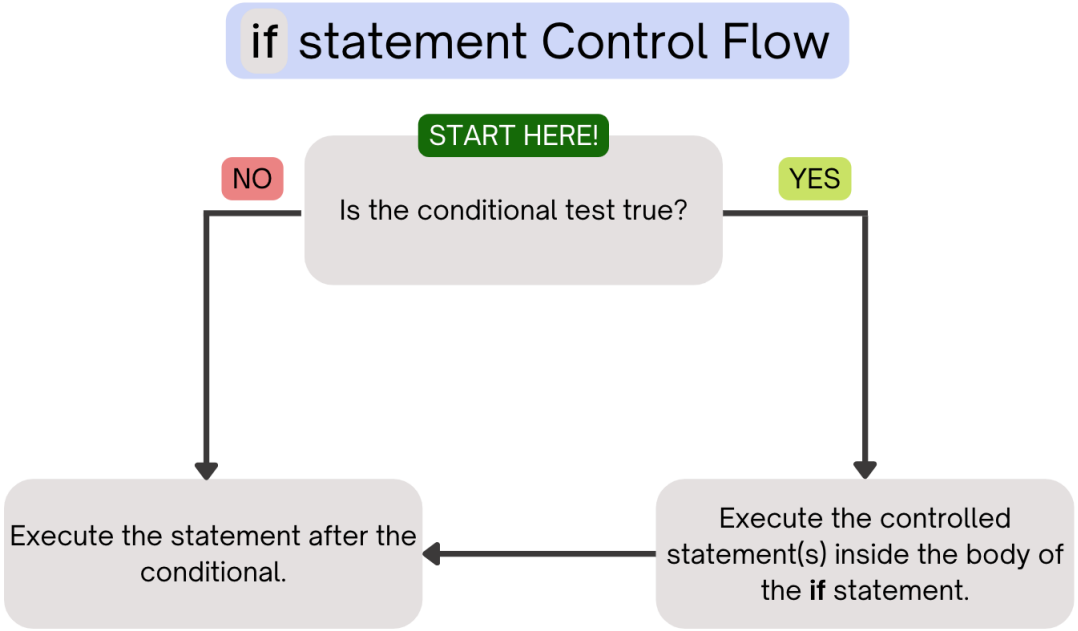
Today's playlist:
CSE 121 24wi lecture beats :D

Announcements, Reminders

- Creative Project 2 released – due Tuesday, Feb 6th
  - Note: uses Javadoc!
  - Also helpful: section problems, + last week's food for thought
- Resubmission Cycle 2 form released
  - Note: this is the last time C0 is eligible for resubmission!
- IPL tips!
- Mid-Quarter Formative Feedback with Ken Yasuhara for part of class on Wednesday, Feb 7th

(PCM) Conditionals (1/4)

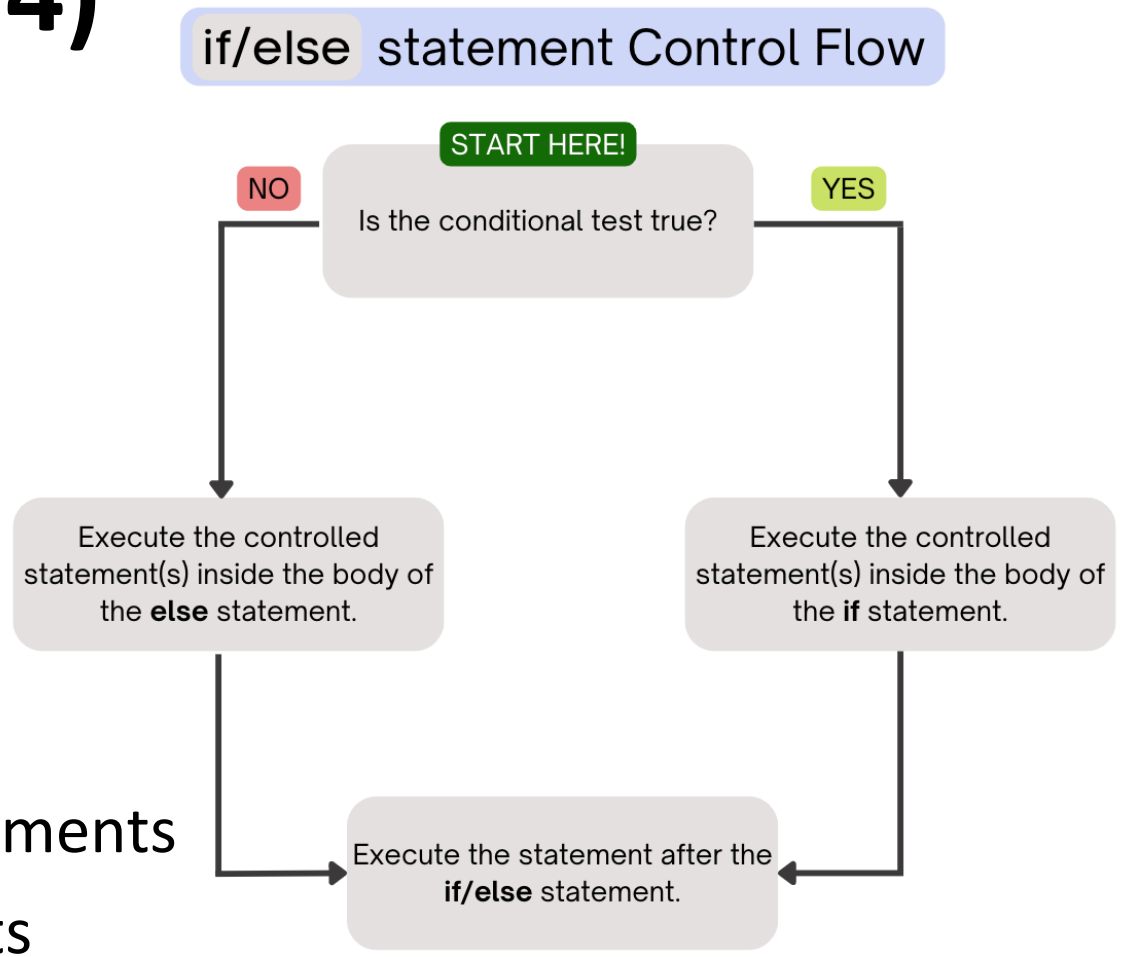
```
if (test) {
    body (statements to be executed)
}
```



Executes a block of statements
if and only if the test is true

(PCM) Conditionals (2/4)

```
if ( test ) {
        statement(s)
} else {
        statement(s)
}
```

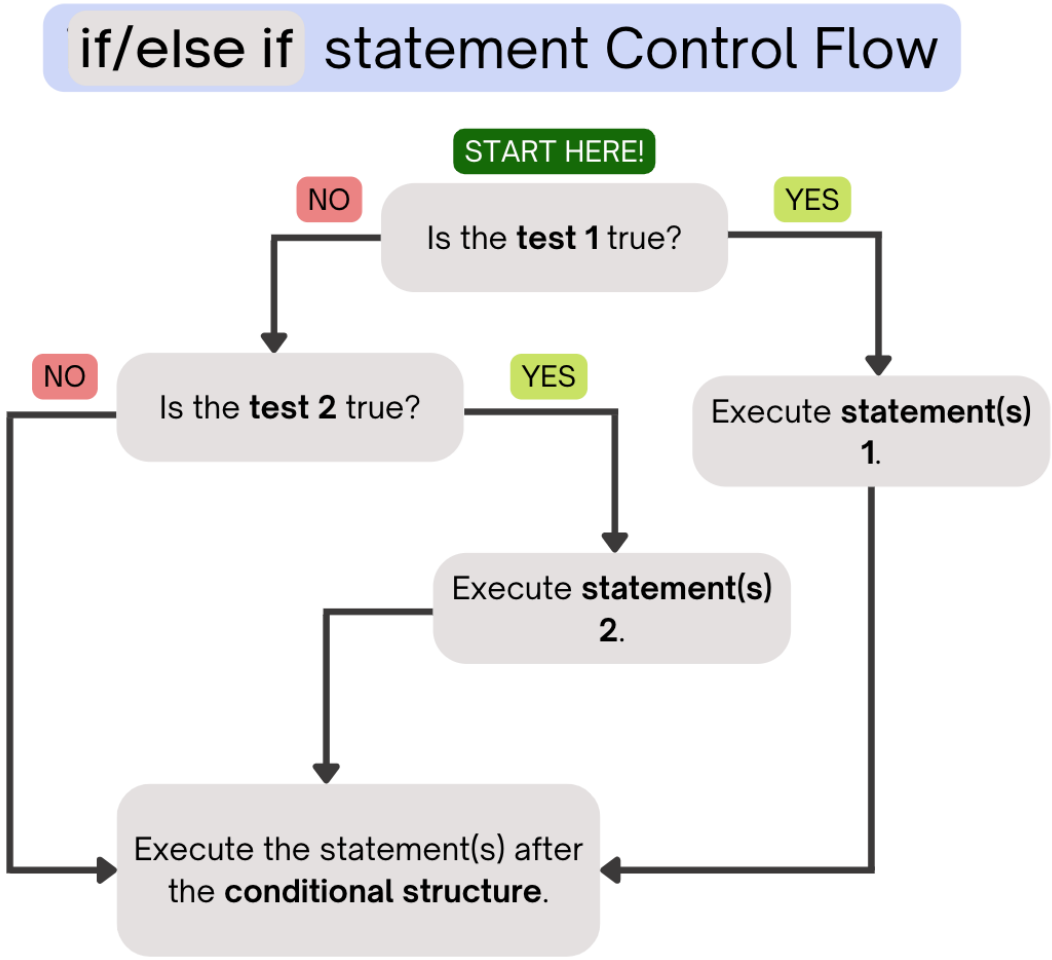


1. If the test is true: execute block of statements
2. If not, execute other block of statements

(PCM) Conditionals (3/4)

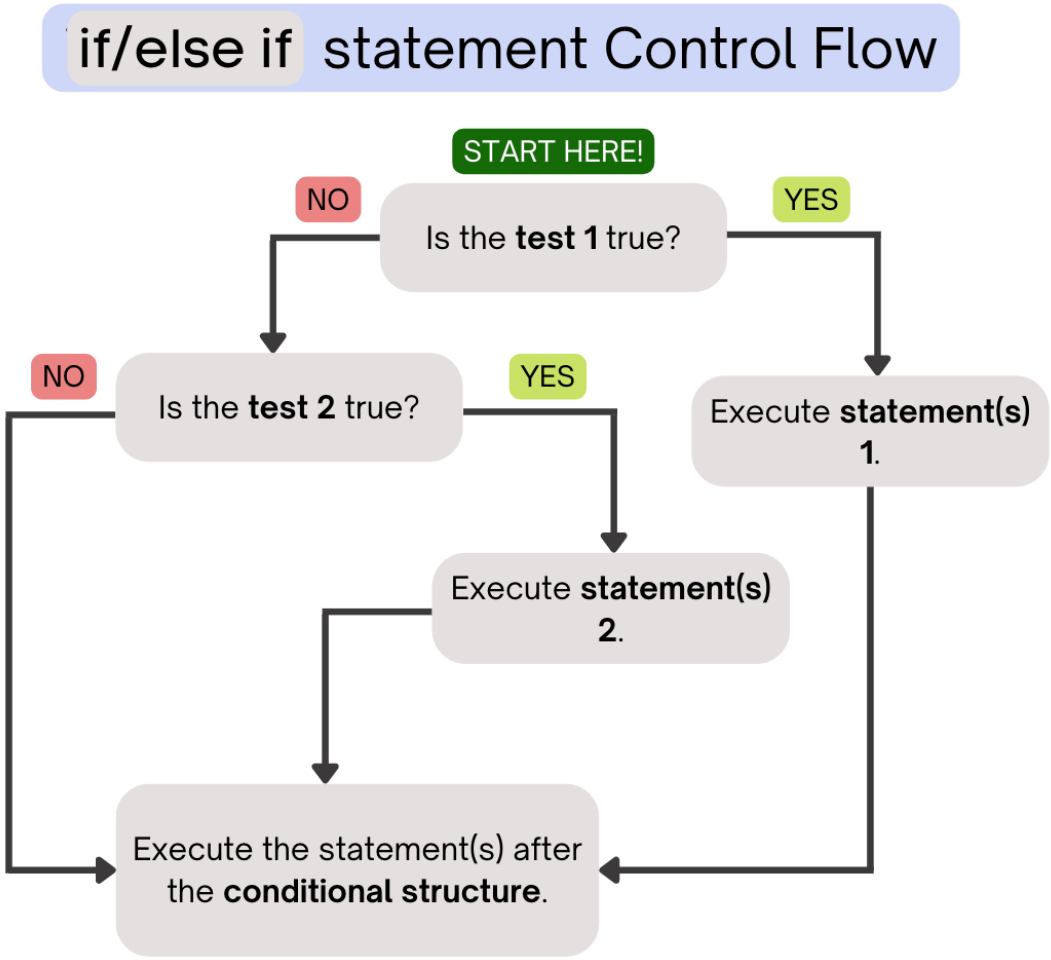
```
if ( test ) {
        statement(s)
} else if (test) {
        statement(s)
}
```

1. If the first test is true, execute that block
2. If not, proceed to the next test, and repeat
3. If none were true, don't execute any blocks



(PCM) Conditionals (4/4)

```
if ( test ) {
        statement(s)
} else if (test) {
        statement(s)
}
```



With a large if-else-if-else chain,

- if there is an ending else, exactly one block will execute
- if there is no ending else, zero or one blocks will execute

Poll in with your answer!

```
public static void main(String[] args) {
  for (int i = 1; i <= 3; i++) {
    System.out.print(mystery(i));
  }
}

public static String mystery(int n) {
  if (n % 2 == 1) {
    return "odd ";
  } else if (n == 1) {
    return "one ";
  }
  return "even ";
}
```

What does this program output?

A. odd even odd

B. one even odd

C. one even even

D. even even even

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Poll in with your answer!

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}

public static String mystery(int n) {
  if (n % 2 == 1) {
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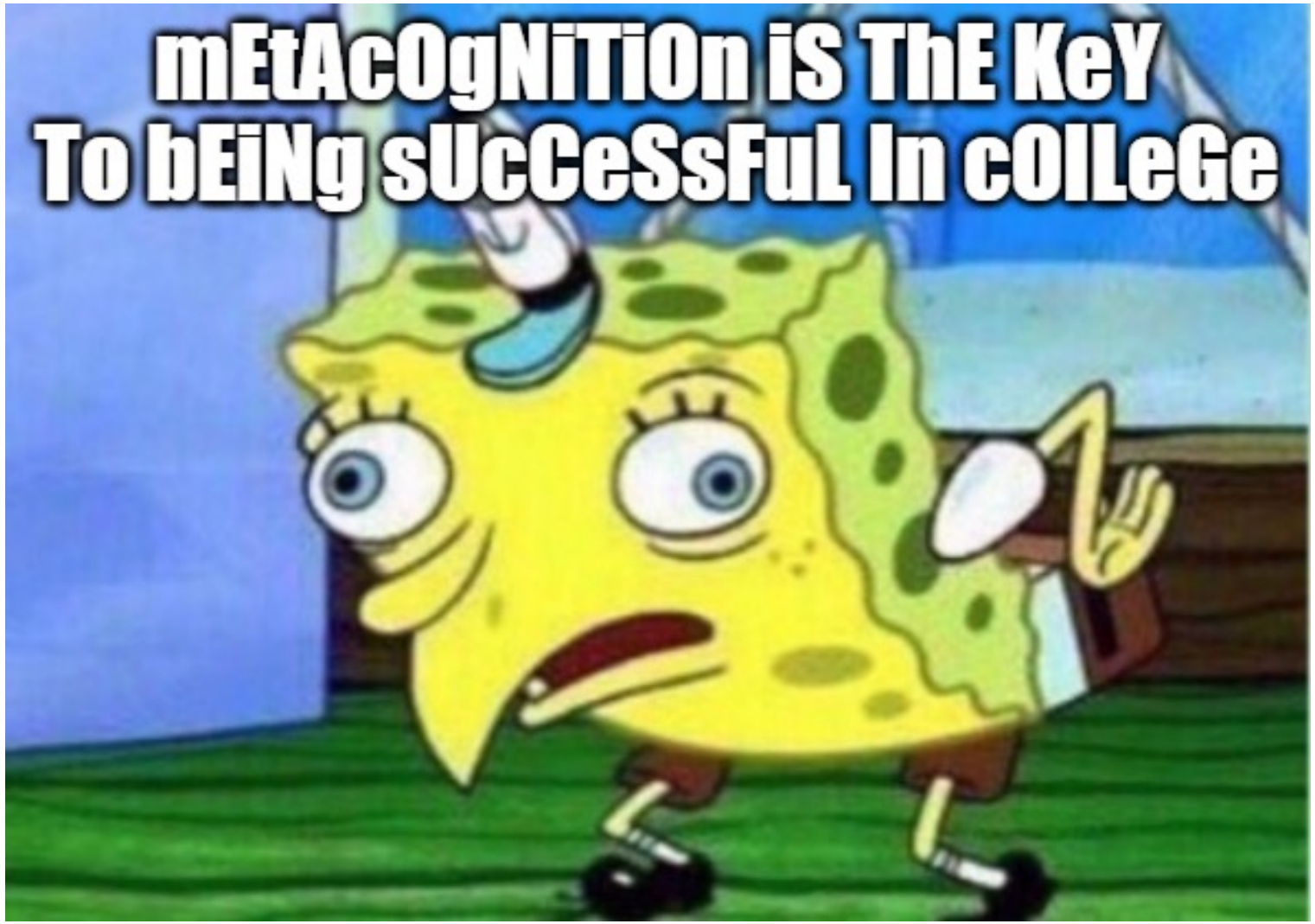
    return "one ";
  }
  return "even ";
}
```

This else if statement never runs!


mEtAcOgNiTiOn iS ThE KeY
To bEiNg sUcCeSsFuL In cOlLeGe

Common Problem-Solving Strategies

- **Analogy** – Is this similar to another problem you've seen?
- **Brainstorming** – Consider steps to solve problem before jumping into code
  - Try to do an example "by hand" → outline steps
- **Solve sub-problems** – Is there a smaller part of the problem to solve?
- **Debugging** – Does your solution behave correctly?
  - What is it doing?
  - What do you expect it to do?
  - What area of your code controls that part of the output?
- **Iterative Development** – Can we start by solving a different problem that is easier?

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Poll in with your answer!

```
int a = 7;
int b = -1;
int c = 12;
if (a < b) {
  a *= 2;
} else if (b < a) {
  a /= 2;
} else {
  a = c;
}
if (c % 2 == 0) {
  c += 1;
}
if (b > 0) {
  b *= -1;
} else if (a < 0) {
  a *= -1;
}
System.out.print(a + " " + b + " " + c);
```

What is the output produced by executing this code?

A. 7 -1 12

B. -3 -1 13

C. 3 -1 13

D. 12 1 12

E. -14 1 13

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Food for Thought

A weekly section where I introduce open problems related to our lecture topic(s) of the week.

Goals:

1. give you “conversational familiarity” with CS terminology
2. see how CS interacts with other fields and people!
3. point you in the direction of more CSE (or adjacent) classes

Note: <u>not tested content.</u> Just food for thought :)

Wait … what?

- We just learned that methods can call themselves. This is called **“recursion”!**
- Fun fact: this is related to many, many concepts you may have seen in math:
  - some keywords: “recurrence relation”, “induction”, “fractals”, “differential equation”
- Another fun fact: this is normally a CSE 123 topic, though at other schools (who start with different languages), you learn this before loops.
- Even funner (?) fact: some programming languages, including some of Matt’s favourites, do not allow variables or loops. You do everything with recursion!

So is this on the test???

Absolutely not.

But…

- this is (subtly) one of the fundamental ideas of computer science and repeats itself everywhere. Including with Social Networks :)
- if you love thinking about methods calling themselves, CSE (or math!) might be the right major for you!!
  - and consider taking CSE 311 and CSE 341 :)