

Course Recap

CS 272 Software Development

Evaluations



Course Evaluations

- BLUE Evaluations
 - Conducted by university
 - Used by instructors AND university
- Belonging Survey
 - Specific to course
 - Related to research project

Where did we start?



What was the first code we covered?

Project Euler, Problem 1

If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23. Find the sum of all the multiples of 3 or 5 below 1000.

<https://projecteuler.net/problem=1>



What was the first code we covered?

```
int max = 1000;  
int sum = 0;  
  
for (int i = 0; i < max; i++) {  
    if (i % 3 == 0 || i % 5 == 0) {  
        sum += i;  
    }  
}
```

<https://github.com/usf-cs272-fall2021/lectures/blob/main/ProjectEuler/src/main/java/Problem1a.java>



What was the first homework?

ArgumentMap

For this homework, you will create a class to parse command-line arguments and store them in a map. For example, consider the following command-line arguments:

```
"-a", "ant", "-b", "bee", "-b", "bat", "cat", "-d", "-e", "elk", "-f"
```

In this case, `-a`, `-b`, `-d`, `-e` and `-f` are all flags since they start with a `-` dash followed by at least 1 non-digit character. The values are `ant`, `bee`, `bat`, `cat` and `elk` since they do not start with a `-` and non-digit character.

Note that `-42` is *not* a flag because the `-` dash is followed by a digit character. Instead it should be interpreted as a value representing a negative number.

Not all flags have values, not all values have associated flags, and values will be overwritten if there are repeated flags. For example, flag `-`

<https://github.com/usf-cs272-fall2021/homework-ArgumentMap-template>



Where do we end up?

back-end and dynamic **front-end (full stack)** of a

Multi-Threaded

in-memory **inverted index**, **web crawler**, and

SEARCH ENGINE

(**database-backed?**) (user tracking via **cookies** or **sessions?**)



What have we learned?



Java Keywords

abstract	continue	for	new	switch
assert	default	if	package	synchronized
boolean	do	goto	private	this
break	double	implements	protected	throw
byte	else	import	public	throws
case	enum	instanceof	return	transient
catch	extends	int	short	try
char	final	interface	static	void
class	finally	long	strictfp	volatile
const	float	native	super	while

<https://docs.oracle.com/javase/specs/jls/se16/html/jls-3.html#jls-3.9>



Java Packages

- java.math, java.text, java.time
- java.io (print writer, buffered reader)
- java.lang (thread, object)
- java.net (socket, uri, url)
- java.nio (path, directory stream)
- java.util (collections framework, concurrent, regex, function, stream)
- java.logging (logger, level)
- java.sql (statement, result set)

<https://docs.oracle.com/en/java/javase/16/docs/api/index.html>



Concepts

File New IO Resource Handling Exception Handling
Data Structures Collections Framework Iteration Search
OOP Principles Mutability Generalization Encapsulation
Inheritance Casting Nested Classes Generics
Lambda Expressions Functional Interfaces Stream Pipelines
Software Testing Unit Testing Assertions Logging



Concepts

Regular Expressions

Multithreading Threads Synchronization Work Queues

Web URI/URL HTTP HTML/CSS Sockets

Jetty Servlets Session Tracking HTTP Cookies

Relational Databases SQL DDL SQL DML JDBC



Tools & Skills

- Git, Github
- Apache OpenNLP
- Apache Log4j2
- Apache Commons
- Eclipse IDE, Maven
- JUnit
- Jetty, Servlets
- URI, URL, Sockets
- HTTP, HTML, CSS
- SQL, JDBC



Piazza Statistics



Piazza At A Glance

Total Posts:	
Total Contributions:	
Instructors' Responses:	
Students' Responses:	
Average Response Time:	

statistics as of 4pm 12/05/2021



	Students				Teacher and Assistants			
Category	Min	Median	Mean	Max	Min	Median	Mean	Max
Days Online								
Views								
Contributions								
Questions								
Notes								
Answers								
Endorsements								



Github Statistics



Total Statistics

Description	Total
Repositories	
Issues	
Pull Requests	
Action Minutes	

Description	Total
Java Files	
Java Comments	
Java SLOC	

statistics as of 4pm 12/05/2021 • actions as of 11/17/2021



Projects Only

Metric	Files	Blank Lines	Comments	Code
Minimum				
Median				
Mean				
Maximum				

statistics as of 4pm 12/05/2021 • only counting main branch



Code Reviews by Type

Statistic	Total Count	Per Item	Per Term	Per Week
Asynchronous Reviews				
Synchronous Reviews				
All Code Reviews				
Lectures				

statistics as of 4pm 12/05/2021 • approximately 10 weeks of code reviews



Code Reviews by Project

	Grade Issues		Synchronous		Asynchronous	
Category	Func	Design	Total	Average	Total	Average
Project 1						
Project 2						
Project 3*						

*statistics as of 4pm 12/05/2021 • average per functionality issue • *many requests still getting completed this week*



What's Next?



Missing Concepts

- Sockets+
- Generics+
- Testing+, Benchmarking+
- Multithreading+
- Servlets+
- Databases+
- Security+
- Deployment, JARs
- Packages, Modules
- AWT, Swing
- Graphics, Sound
- Serialization
- Internationalization
- *And More...*



Followup Courses?

- **Career Prep Course** (2 Units, Optional)
- CS 490 **Senior Team Project** (4 Units, Required)
- CS 345 **Programming Languages** (4 Units, Theory)
- CS 333 Intro to **Database Systems** (4 Units, Application)
- CS 336 **Computer Networks** (4 Units, Application)
- Topics: **Computer Security, Distributed Systems...**

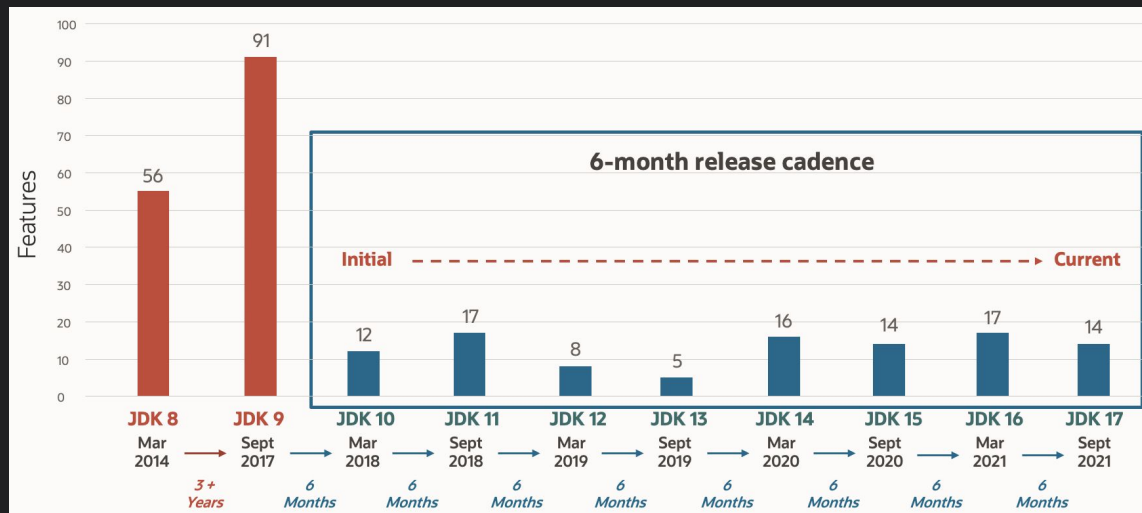


Oracle Java SE Support Roadmap**				
Release	GA Date	Premier Support Until	Extended Support Until	Sustaining Support
7 (LTS)	July 2011	July 2019	July 2022*****	Indefinite
8 (LTS)**	March 2014	March 2022	December 2030*****	Indefinite
9 (non-LTS)	September 2017	March 2018	Not Available	Indefinite
10 (non-LTS)	March 2018	September 2018	Not Available	Indefinite
11 (LTS)	September 2018	September 2023	September 2026	Indefinite
12 (non-LTS)	March 2019	September 2019	Not Available	Indefinite
13 (non-LTS)	September 2019	March 2020	Not Available	Indefinite
14 (non-LTS)	March 2020	September 2020	Not Available	Indefinite
15 (non-LTS)	September 2020	March 2021	Not Available	Indefinite
16 (non-LTS)	March 2021	September 2021	Not Available	Indefinite
17 (LTS)	September 2021	September 2026****	September 2029****	Indefinite
18 (non-LTS)***	March 2022	September 2022	Not Available	Indefinite
19 (non-LTS)***	September 2022	March 2023	Not Available	Indefinite
20 (non-LTS)***	March 2023	September 2023	Not Available	Indefinite
21 (LTS)***	September 2023	September 2028	September 2031	Indefinite

<https://www.oracle.com/java/technologies/java-se-support-roadmap.html>

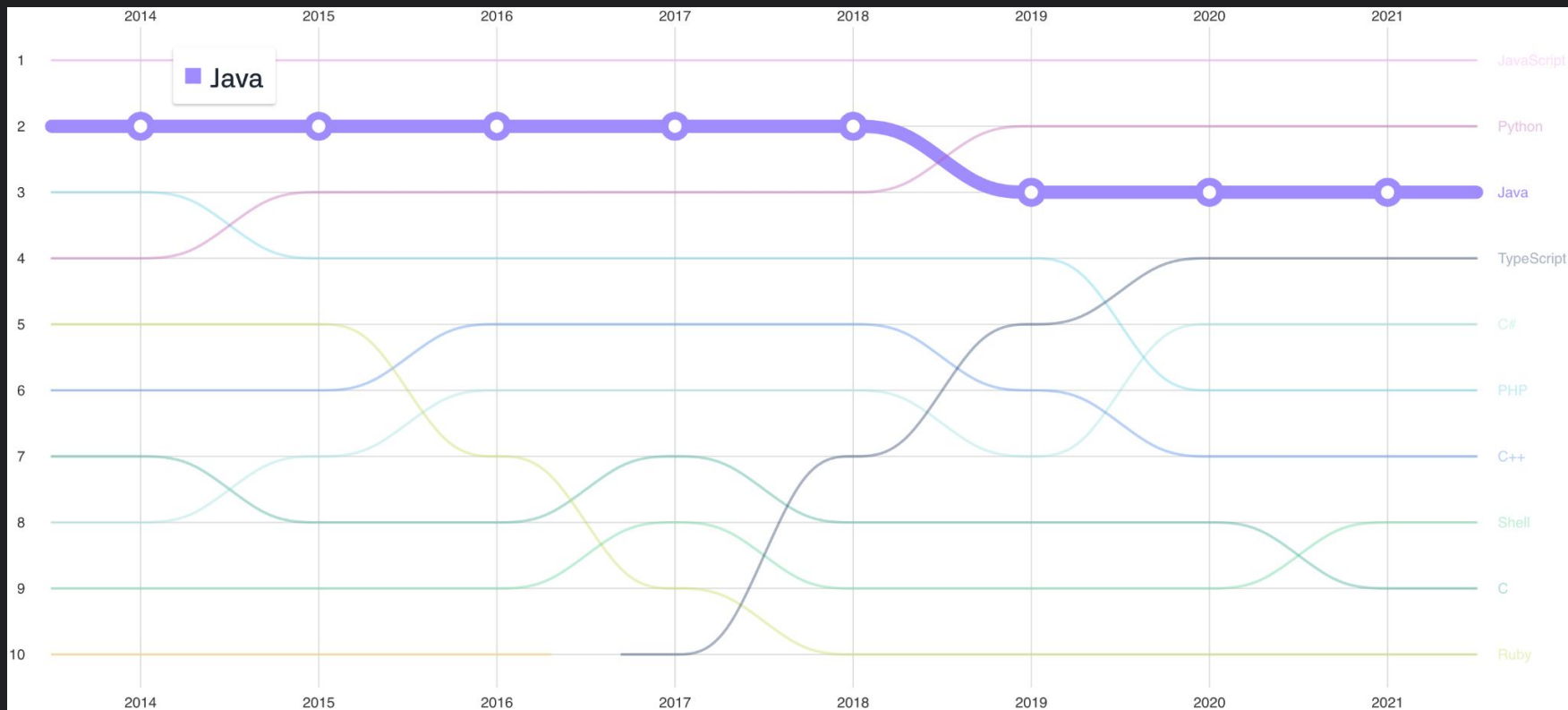


Java 17



"According to an IDC report over ten million developers, representing 75% of full-time developers worldwide, use Java, more than any other language."

<https://blogs.oracle.com/java/post/announcing-java17>



<https://octoverse.github.com/#top-languages>



Historical Perspective

- Know someone **178** or older?
 - The first computer program or algorithm was published in 1843.
- Know someone **85** or older?
 - Formal models of algorithms and modern computers were invented in 1936.

https://en.wikipedia.org/wiki/Computer_science · https://en.wikipedia.org/wiki/History_of_computer_science



Historical Perspective

- Know someone **62** or older?
 - The term "computer science" first appears in literature in 1959.
- Know someone **59** or older?
 - The first CS degree in the US was offered at Purdue University in 1962.

https://en.wikipedia.org/wiki/Computer_science · https://en.wikipedia.org/wiki/History_of_computer_science



Historical Perspective

- Know someone **52** or older?
 - The first message was sent over ARPANET, the precursor of the Internet, in 1969.
- Know someone **50** or older?
 - The first personal computer was released in 1971.

https://en.wikipedia.org/wiki/Computer_science · https://en.wikipedia.org/wiki/History_of_computer_science



Historical Perspective

- Know someone **32** or older?
 - The World Wide Web was invented in 1989.
 - The Python programming language was first implemented in 1989.
- Know someone **14** or older?
 - Apple released the first iPhone in 2007.

https://en.wikipedia.org/wiki/Computer_science · https://en.wikipedia.org/wiki/History_of_computer_science

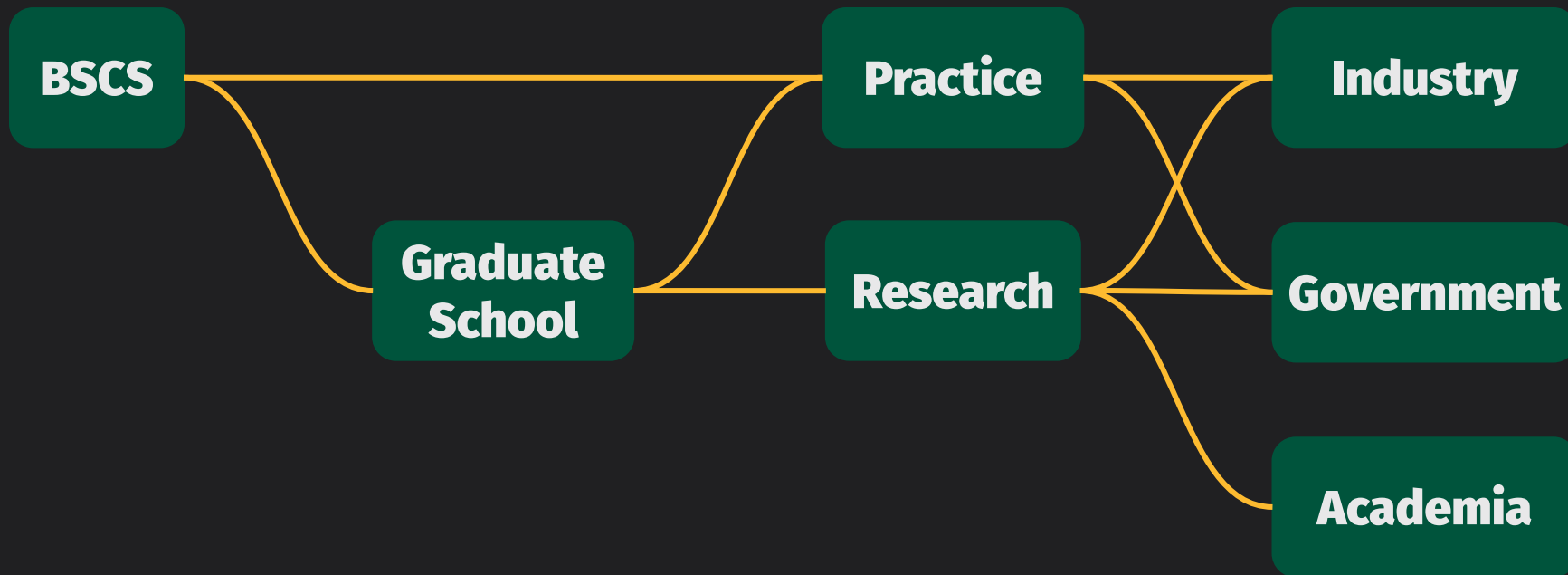


Computer Science...

- Constantly changing
 - Must be constantly learning
- Increasing in ubiquity, impact, and importance
 - Must consider ethics, diversity, accessibility
- Multiple career paths and subfields
 - Sometimes tricky to find what is right for you

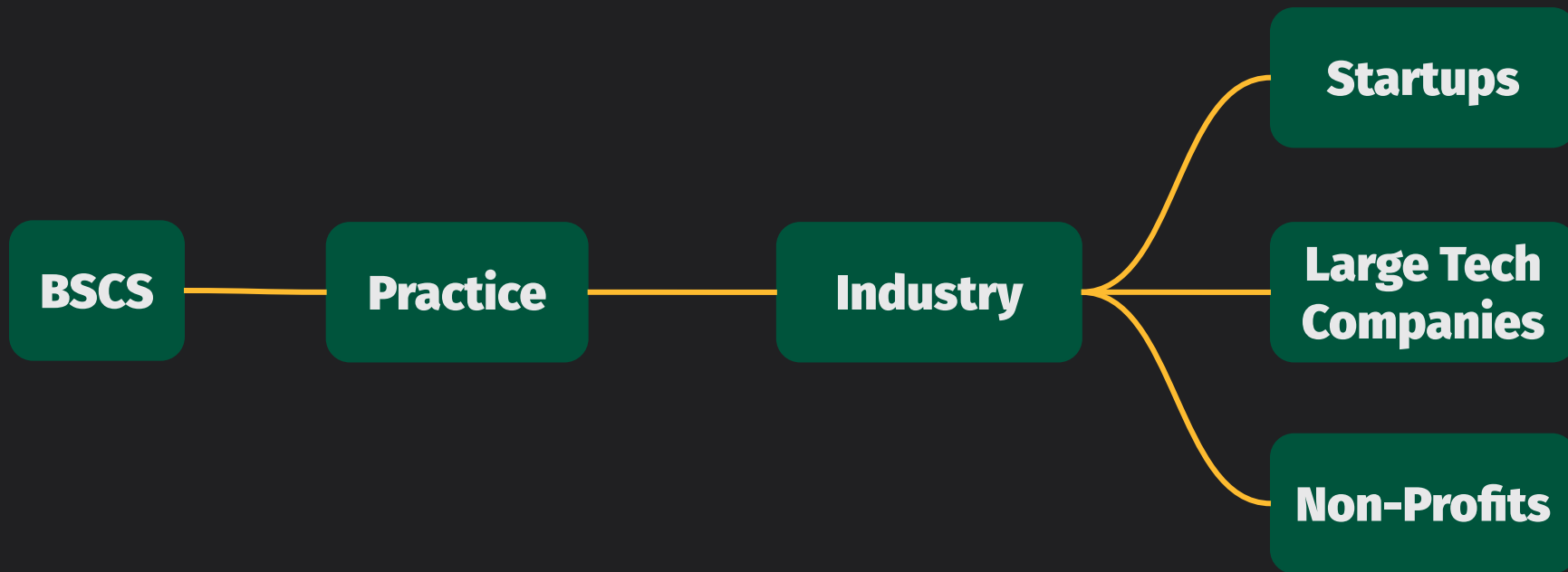


Career Paths in CS



**General picture, exceptions exist!*

Career Paths in CS



**General picture, exceptions exist!*

Many Possible Job Titles...

- First, choose a broad specialization...
 - Software, Security, Network, Systems, Database, Data, Cloud, UX, etc.
- Next, choose a job title...
 - Developer, Engineer, Analyst, Administrator, Architect, Designer, Manager, Researcher, Scientist, Teacher, etc.
- Or, choose a more focused specialization...
 - Finance, Computational Biology, Bioinformatics, Medicine, Games, Environment, Education, etc.

Closing



BE PROUD!

You are a computer scientist.
You have a powerful skill set.



Ask Me (Almost) Anything

Top



Thank You!

