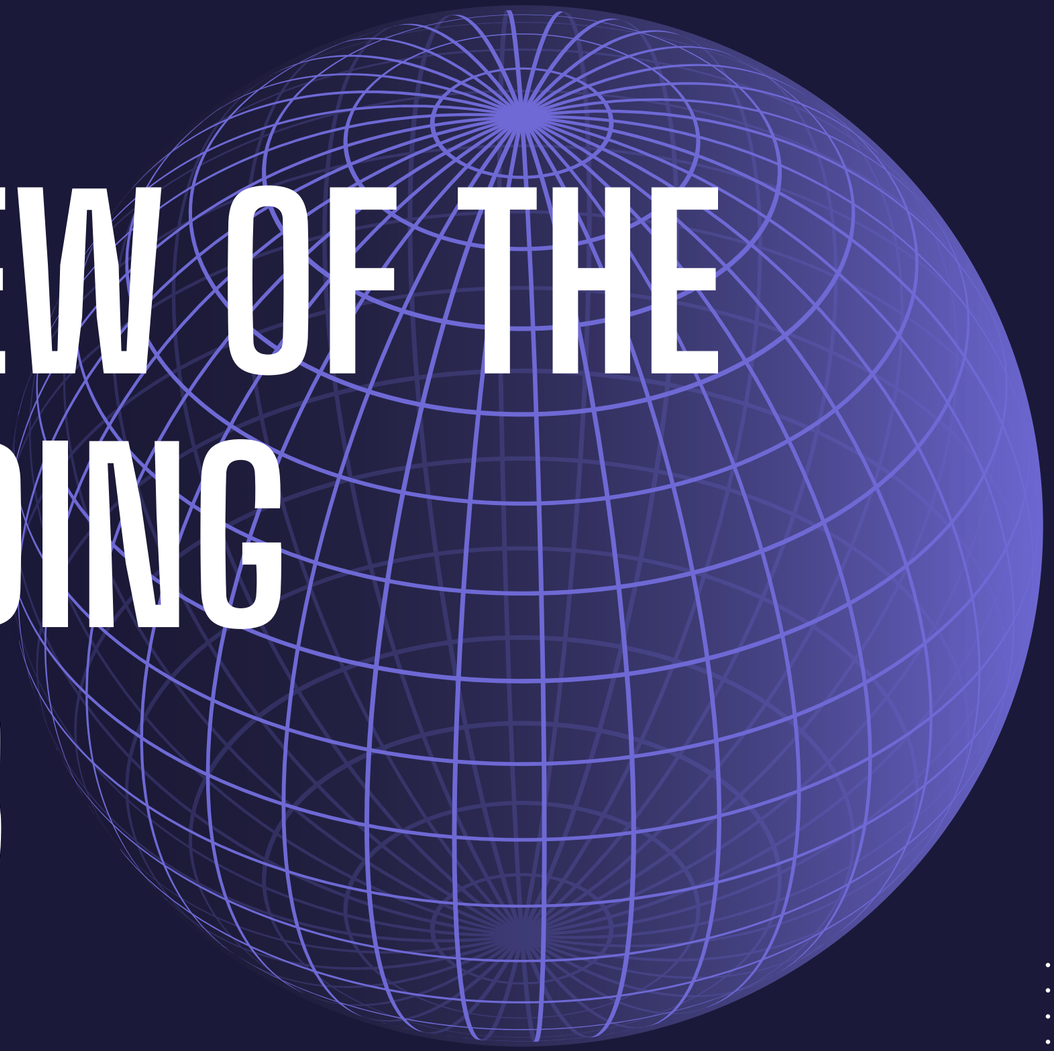
001

AN OVERVIEW OF THE MAJOR CODING LANGUAGES



HAWLEY HELMBRECHT

MVP GROUP MEETINGS | **NANCE LAB** - UNIVERSITY OF WASHINGTON

LET'S EXPLORE!

Today's Agenda

- Explore a brief history of coding languages
- Discover the wide breadth of languages that exist
- Classify languages based on their main practical uses
- Visualize the languages in relationship to our work and projects

DATA SCIENCE MODULE INTRO

Expectations and Outcomes

Objectives are (1) to become familiar with the basic history of coding languages (2) learn the main purposes of some major coding languages (3) visualize the the relationship between a variety of coding languages and our work

Outcomes are (1) a visual history of coding languages, (2) a visualization of coding languages and relation to our work, and (3) ability to vocalize purpose and application of main coding languages

CODING LANGUAGES

A Brief History

THE BEGINNING OF LANGUAGE

ADA LOVELACE - THE FIRST LANGUAGE

1843: Ada Lovelace wrote an applied algorithm for the Analytical Engine - the first mechanical computer

EMERSION OF THE FIRST LANGUAGES

- Beginning: Hand tuned assembly languages
- FORTRAN: Developed by IBM as the first high-level general programming language
-Development of nested blocks
- Development of complex SYNTAX

EVOLUTION OF CODING FRAMEWORKS

- 1960s: first object-oriented programming languages
- 1970s: first logical based programming language
- 1970s: first statically typed function based programming

Debates about the best coding language frameworks begins to emerge

THE EVOLUTION OF COMPUTER LANGUAGES

POPULARITY OF THE INTERNET (1990S)

- Java grows in popularity due to its ability to be integrated with a web browser
- Functional languages become popular to maximize productivity of programmers
- Emersion of scripting languages (Python)

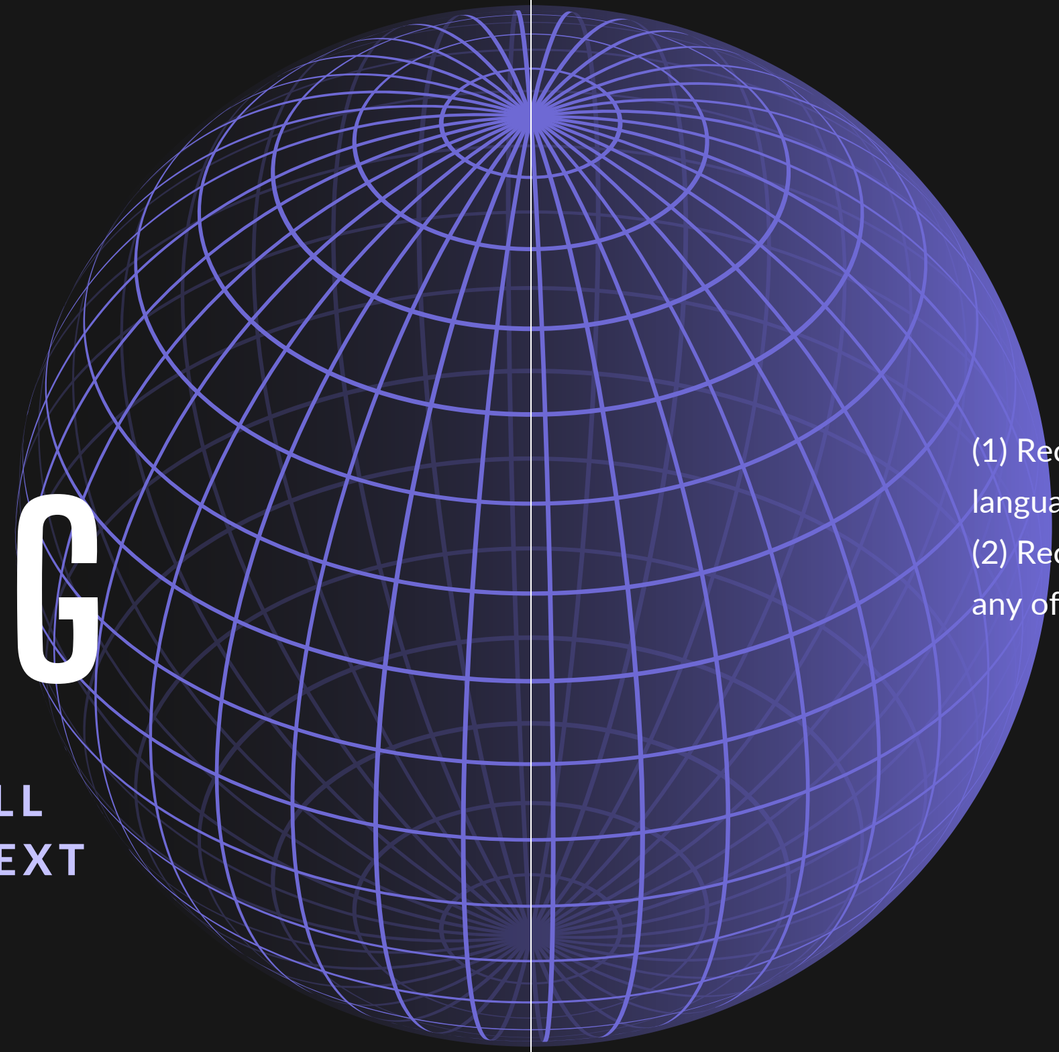
THE MODERN MUSES

- Python, Java, and C still hold as popular languages today!
- Current Trends:
    - Open Source Languages
    - High parallelization
    - Visual Programming Languages
    - Quantum Computing!

DATA SCIENCE IN BIOLOGICAL SCIENCES

In order to account for large amounts of data and stay current with technology and the pace of the computer science world, biological science has embraced the role and job of the data scientist!!

RECALL WARNING



THERE WILL BE A RECALL ACTIVITY AFTER THE NEXT FEW SLIDES

(1) Recall at least three of the languages
(2) Recall a three facts about any of the languages

LOOK AT THE LANGUAGES

JAVA

Date Developed: 1995

Popularity: 17.67% (2)

Main Purposes:

- General-purpose Language

- Browser-based apps

Fun Fact: The original name was Oak

JAVASCRIPT

Date Developed: 1995

Popularity: 8.02% (3)

Main Purposes:

-Object-oriented Language

- Creates interactive web page elements

Fun Fact: Not explicitly related to Java

PHP

Date Developed: 1995

Popularity: 6.02% (5)

Main Purposes:

- Server Side Scripting Language

- Develops websites

Fun Fact: Mascot is a "big blue elephant"

*Popularity based on tutorial searches on Google from: http://pypl.github.io/PYPL.html

LOOK AT THE LANGUAGES

RUBY

Date Developed: 1995

Popularity: 1.23% (15)

Main Use(s):

- General-purpose scripting language

- Building web applications

Fun Fact: Name Ruby since it is "more powerful than perl

R

Date Developed: 1993

Popularity: 3.86% (7)

Main Use(s):

- Multi-paradigm language

- Statistical Computing Design

Fun Fact: Named since it is an implementation of the language "S"

HTML

Date Developed: 1989

Popularity: -

Main Use(s):

- Markdown Language

- Design Webpages

Fun Fact: Hawley's first language

*Popularity based on tutorial searches on Google from: http://pypl.github.io/PYPL.html

LOOK AT THE LANGUAGES

C

Date Developed: 1972

Popularity: 5.69% (6)

Main Use(s):
- Low level assembly code

Fun Fact: Oldest of the C languages

C#

Date Developed: 2001

Popularity: 6.87% (4)

Main Use(s):
- Windows operating system

Fun Fact: The # is meant to be a sharp from music.

C++

Date Developed: 1980

Popularity: 5.69% (6)

Main Use(s):
- C implementation across platforms: linux, windows, macOS

Fun Fact: Originally nicknamed the "new" C

OBJECTIVE-C

Date Developed: 1986

Popularity: 2.5% (8)

Main Use(s):
- macOS and iOS development

Fun Fact: Named as its a superset of C.

*Popularity based on tutorial searches on Google from: http://pypl.github.io/PYPL.html

LOOK AT THE LANGUAGES

MATLAB

Date Developed: 1984

Popularity: 1.72% (11)

Main Use(s): Commonly used in industry and science applications.

Fun Fact: The default image is a steganographic image - it hides other pictures beneath the first.

SQL

Date Developed: 1978

Popularity: -

Main Use(s):
- Database management

Fun Fact:
- > 50 years old and originally designed by IBM

PYTHON

Date Developed: 1990

Popularity: 31.6% (1)

Main Use(s): Pretty much anything

Fun Fact: Named after Monty Python's Flying Circus

*Popularity based on tutorial searches on Google from: http://pypl.github.io/PYPL.html

FOOD FOR THOUGHT

IS DATA SCIENCE A FAD?

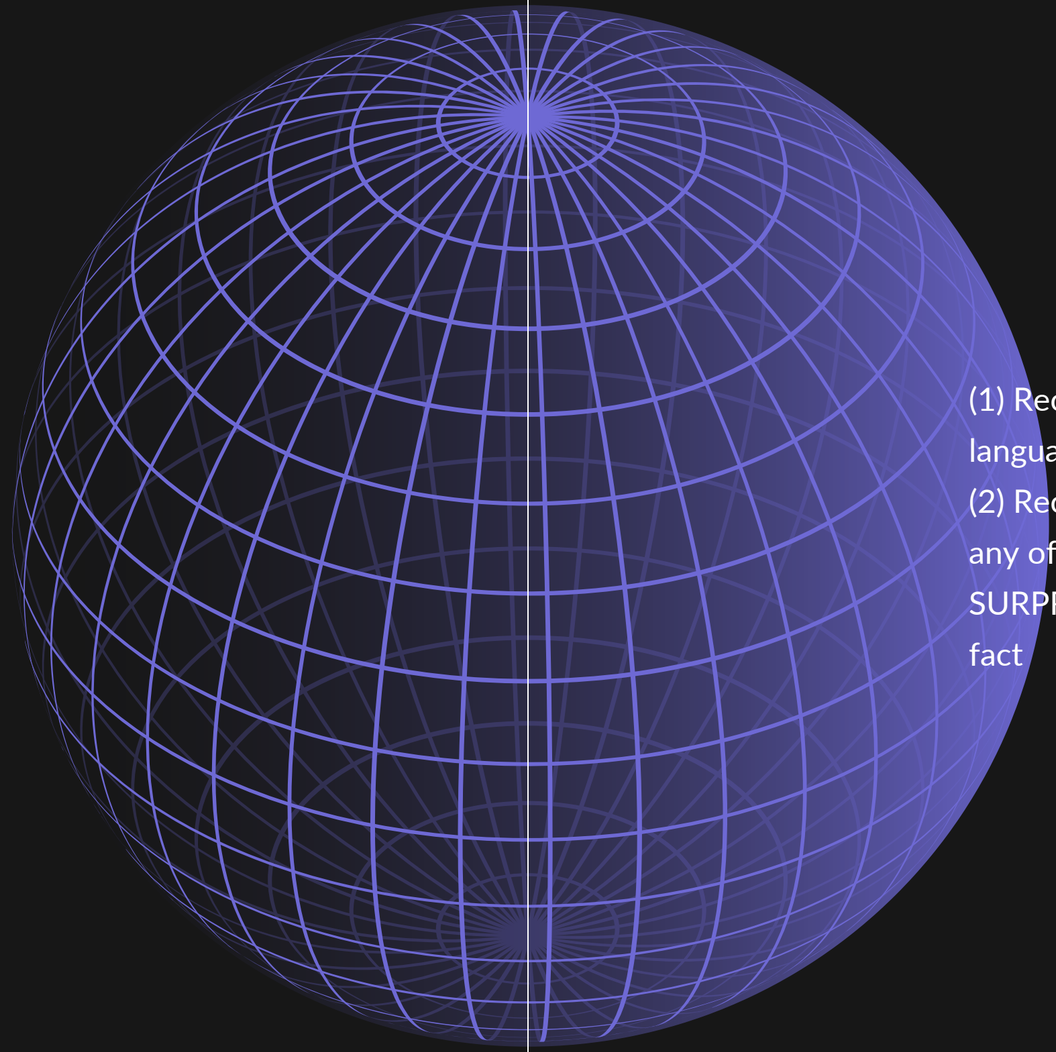
ARE EDUCATIONAL INSTITUTIONS PROPERLY TRAINING STUDENTS TO KEEP UP WITH THE DATA SCIENCE WAVE?

IS DATA SCIENCE IN THE BIOLOGICAL SCIENCES AT THE SAME LEVEL AS COMPUTER SCIENCE IN APPLICATIONS?

IS EVERYTHING CLEAR?

Ask any of your questions or throw them in chat!

RECALL



(1) Recall at least three of the languages
(2) Recall a three facts about any of the languages
SURPRISE: Your favorite fun fact

RECALL SET 1

Everyone Share at Least Three Languages

1

Which languages are the most comon in recall?

2

What about those languages helped you recall them?

3

Which language are you most interested in learning more about?

RECALL SET 2

Three facts about any of the languages

1

Which languages are the most common facts from the group from?

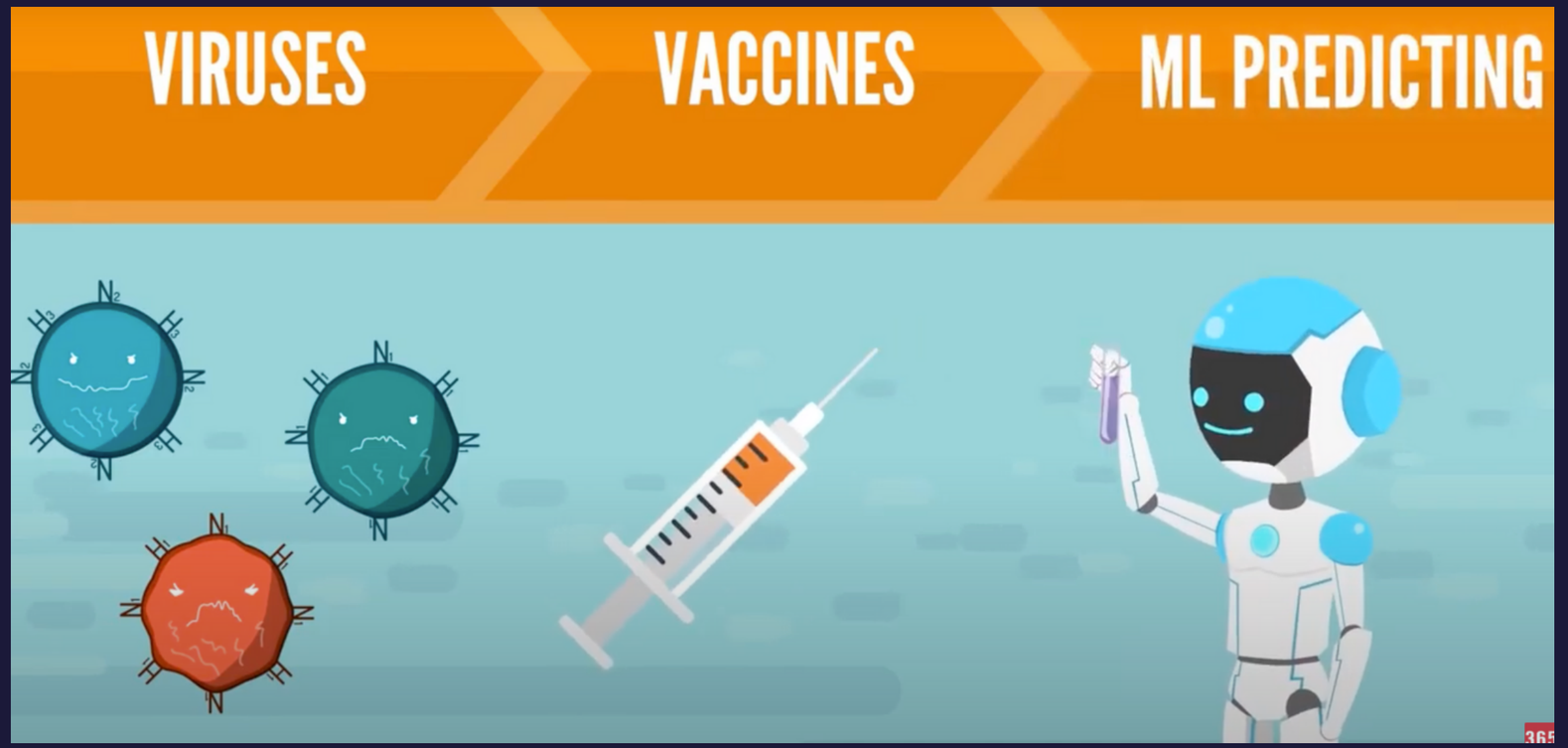
2

What about these facts made them stand out to you?

3

What is your favorite fun fact?

WATCH THIS VIDEO: DATA SCIENCE AND INFLUENZA



https://www.youtube.com/watch?v=gfdzwlnVDvI.

DATA SCIENCE IN THE BIOLOGICAL SCIENCES

NEW QUANTIFICATION METHODS

WET LAB & MODELING INTEGRATION

HIGH THROUGHPUT CAPABILITIES

NEW COLLABORATIONS

ADDITIONAL RESOURCES

https://en.wikipedia.org/wiki/History_of_programming_languages

https://www.geeksforgeeks.org/the-complete-history-of-java-programming-language/

.

RECAP OF TODAY'S MODULE

HISTORY OF THE LANGUAGES

LANGUAGES: THEIR PLACES AND PURPOSES

AN OVERVIEW OF MAJOR LANGUAGES

BIOLOGICAL SCIENCES INTEGRATED WITH DATA SCIENCE

THANK YOU FOR BEING A LOVELY TEAM.

Next Week's Modules: So you are a data scientist now? & Intro to Python

Next Week's Activities: Defining a Data Scientist & Downloading Python and Opening Jupyter Notebook