



# Introduction

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# Hybrid Instruction

In-person (Murdoch 814)

Follow all University guidelines

Building access

Masks required

Zoom

Attend **synchronously**

Lecture recordings are for reference





# Zoom Etiquette

- Video on is preferred (but not required)
- Stay on Mute
- Use Chat to ask/respond to questions
  - "Raise Hand" if I don't notice chat or want to share screen/speak on Zoom
- Let me know if something isn't working





# “Bioinformatics”

## Bioinformatics, Computational, and Systems Biology

Bioimaging

Proteomics

Sequence Analysis

Genomics

Molecular  
Dynamics

Drug Discovery

Biomedical  
Informatics

**bio·in·for·mat·ics** *noun plural but singular in construction* \,bī-ō-in-fər-'ma-tiks\  
**Definition of BIOINFORMATICS**   
: the collection, classification, storage, and analysis of biochemical and biological information using computers especially as applied to molecular genetics and genomics  
— **bio·in·for·mat·ic** *adjective*

Cheminformatics

Systems Modeling

Data Analysis

Protein Dynamics

Protein Structure





# “Programming”

## Computer programming

From Wikipedia, the free encyclopedia

*There is an on-going debate on the extent to which the writing of programs is an [art](#) form, a [craft](#), or an [engineering](#) discipline.*

**Computer programming** (often shortened to **programming**) is the comprehensive process that leads from an original formulation of a computing problem to executable programs. It involves activities such as analysis, understanding, and generically solving such problems resulting in an [algorithm](#), verification of requirements of the algorithm including its correctness and its resource consumption, implementation (or coding) of the algorithm in a target programming language, [testing](#), [debugging](#), and maintaining the [source code](#), implementation of the build system and management of derived artefacts such as machine code of [computer programs](#). The algorithm is often only represented in human-parseable form and reasoned about using logic. Source code is written in one or more [programming languages](#) (such as [C++](#), [C#](#), [Java](#), [Python](#), [Smalltalk](#), etc.). The purpose of programming is to find a sequence of instructions that will automate performing a specific task or solve a given problem. The process of programming thus often requires expertise in many different subjects, including knowledge of the application domain, specialized [algorithms](#) and [formal logic](#).



# Python

Designed to be easy to learn

Full featured, powerful language

Free - Costs nothing and open-source

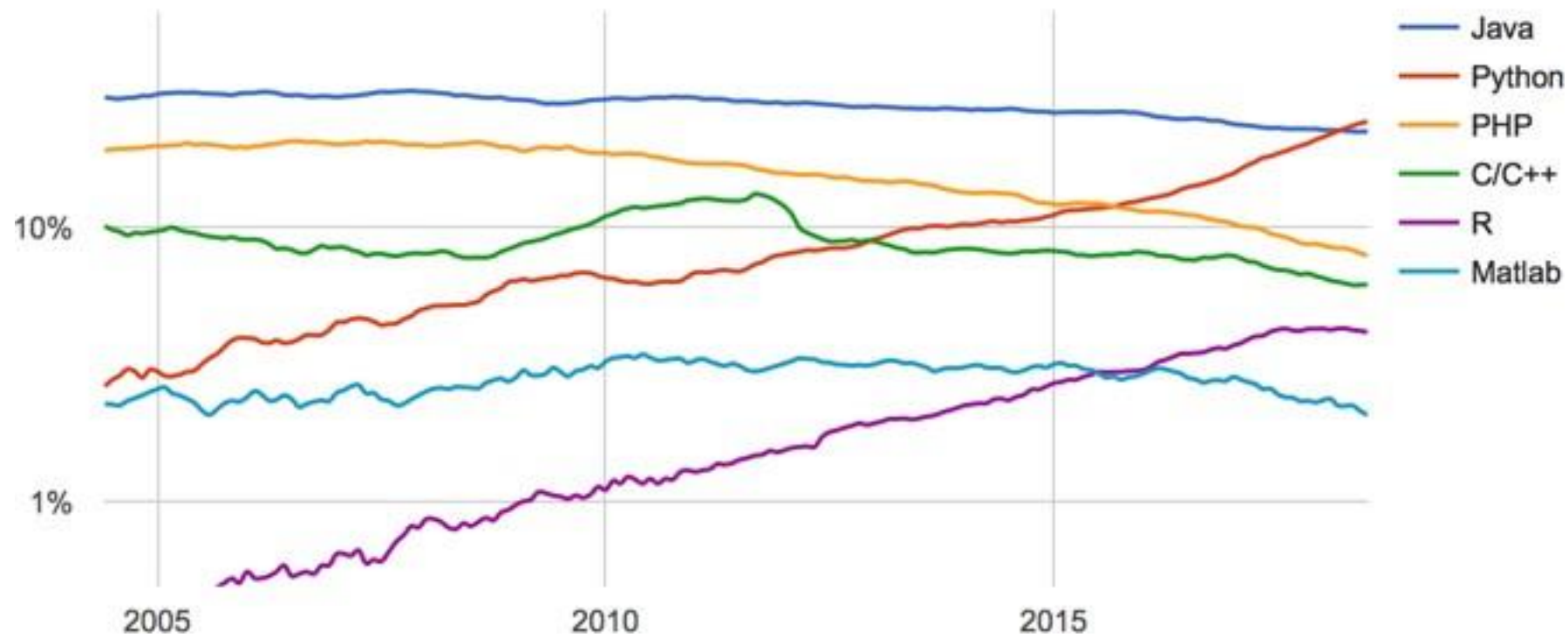
Ideal for *scripting*

Popular





PYPL Popularity of Programming Language



<http://pypl.github.io/PYPL.html>



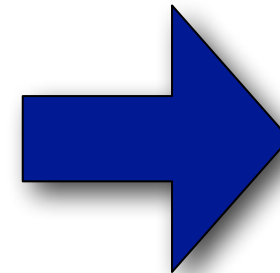
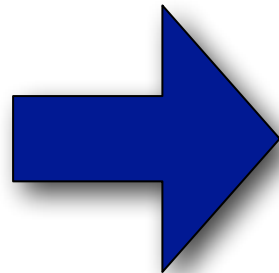
Language Rank	Types	Spectrum Ranking
1. Python		100.0
2. C++		98.4
3. C		98.2
4. Java		97.5
5. C#		89.8
6. PHP		85.4
7. R		83.3
8. JavaScript		82.8
9. Go		76.7
10. Assembly		74.5

<https://spectrum.ieee.org/at-work/innovation/the-2018-top-programming-languages>



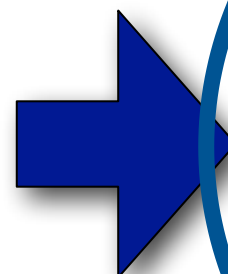
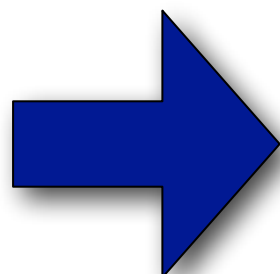


# Course Goals



“Analyze the data”

“Do it again”



“Analyze the data”

“Do it again”





# Course Goals

Gain experience programming

Learn Python

Survey computational methods

*Improve skills to be a more productive  
and successful researcher*



# Logistics

## 12 Programming Assignments

Due midnight on Tuesday

Autograded - submit until it works

1 day late - 90% credit

2 days late - 50% credit

**>3 days late - 0% credit**

Late penalty only applied to *additional* points

Each assignment worth ~7%

Final Project (create an assignment)

### Final Grades

A: >93%

B: >85%



# Getting Help

## General questions

- Ask in Canvas

- Ask after class in classroom

## One-on-one help

- Get in touch with Hanxi



# Academic Honesty

Do your own work

Do **not** share or look at other students' code

**Do** discuss concepts and problem solving strategies





# Website

<https://mscbio2025.github.io/intro2022/>

Commandline Basics  
Laptop setup