Class 1 - Command Line and Git Basics

[w200] MIDS Python Course Summer 2018

Course Content | First 8 Weeks - Programming

Unit 1 | Introduction, the Command Line, Source Control

Unit 2 | Starting Out with Python

Unit 3 | Sequence Types and Dictionaries

Unit 4 | More About Control and Algorithms

Unit 5 | Functions

Unit 6 | Complexity

Unit 7 | Classes

Unit 8 | Object-Oriented Programming

Week 1 | Agenda

Welcome to MIDS! (and ISVC)

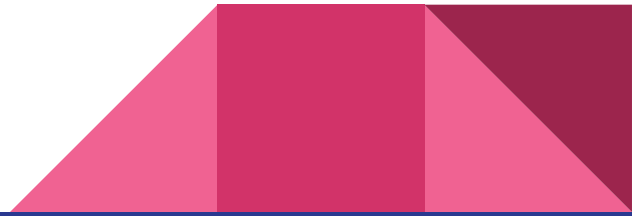
Who are you?

Coding Languages

Using the Command Line

Version Control with Git and Github

Homework Preview



Welcome to MIDS | Python Bridge

The role of this course is to give you the basic tools for success in the MIDS program.

Python… but with a Data Science focus and twist!

Welcome | Logistics

Asynchronous, class meetings, and breakout sessions

Homeworks and assignments

https://github.com/MIDS-INFO-W18/assignments_upstream_summer18

The Google group list

https://groups.google.com/forum/#!forum/w200-python-2018-summer

Using github to get and submit your assignments

Welcome | Logistics

Slack channel

- ucbischool.slack.com
- channel #w200-python

In your browser

- https://ucbischool.slack.com/messages/C5AL99BU6/

Welcome | Content

15 weeks

Programming flow and control structures
Variables, conditional logic, looping, functions
Object oriented - modules, classes, OOP approach
Functional programming
Text processing
Numpy for vectorized operations
Data analytics in Jupyter (pyData)

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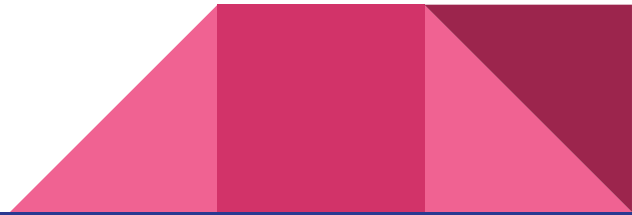
Individual Object Oriented Project



Welcome | Last 7 Weeks - Data Analysis

Unit 9 | Working With Text and Binary Data

Unit 10 | NumPy

Unit 11 | Data Analysis With Pandas

Unit 12 | More Analysis With Pandas

Unit 13 | Testing

Data Analysis Group Project

Welcome | Grading

Homework (30%)

Project 1 object oriented, individual (20%)

Project 2 data analysis, group (20%)

Participation (10%)

Midterm (10%)

Final (10%)

Welcome | Course Schedule

https://docs.google.com/spreadsheets/d/11DxadnNwyFaJIPYLUJSPUlNGCtTenBCR4yaR1CbFBKg/edit#gid=0

Welcome | The ISVC

Synchronous Session - Camera and Python access required

Module types

Private and public chatting encouraged!

Breakout Rooms - Share screen

Using github to get and submit your assignments

How has it been using the ISVC?

Welcome | Survey and GitHub/Python Access

- Fill out intake survey
- Access to Google Group
- Have access to a terminal prompt
- Set up github/ homework REPO
- Pushed first activity to homework REPO
- Can open Jupyter notebook with Python 3 Kernel
- Have the ability to share screen in IVSC

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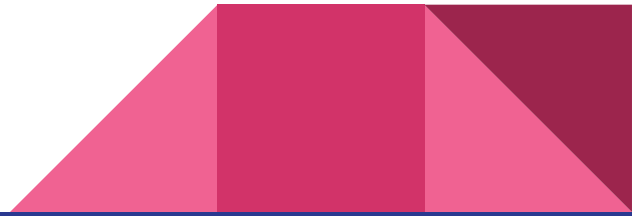


Introductions | Who are you?

1-2 minute intro

Where are you from?

Where do you work? How does data relate?

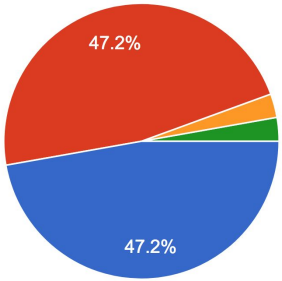
Why MIDS?

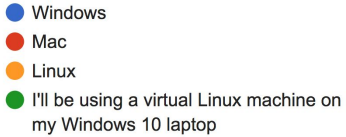
What are you excited for in learning Python?

Introductions | Survey Says...

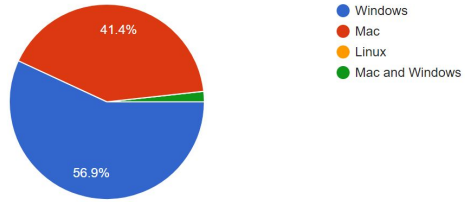
What kind of computer will you be using for this course?

36 responses





*Last semester

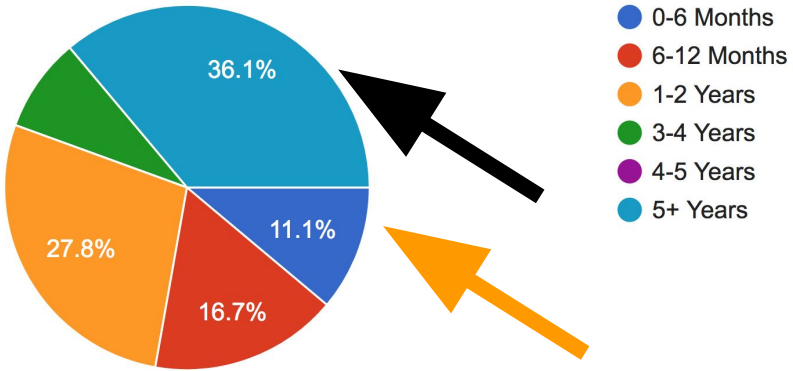


Note: As you will learn in w209, use of pie charts is generally frowned upon by data visualization experts. The human eye is much better suited to compare the height of bars than the area of wedges. We are using these in this deck simply because Google Forms outputs them.

Introductions | Survey Says...

How much programming experience do you have?

36 responses



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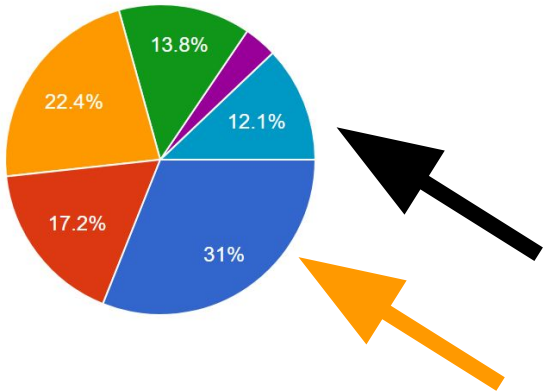
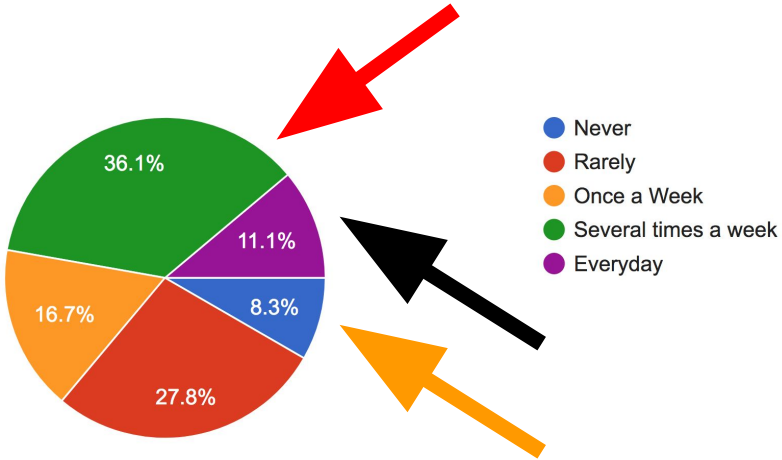


Introductions | Survey Says...

How often do you currently write code?

36 responses



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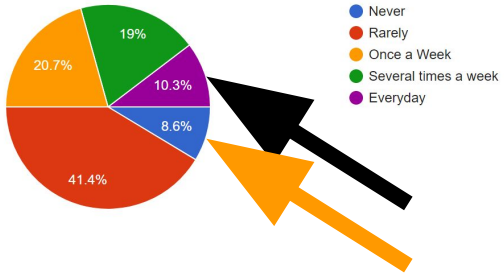
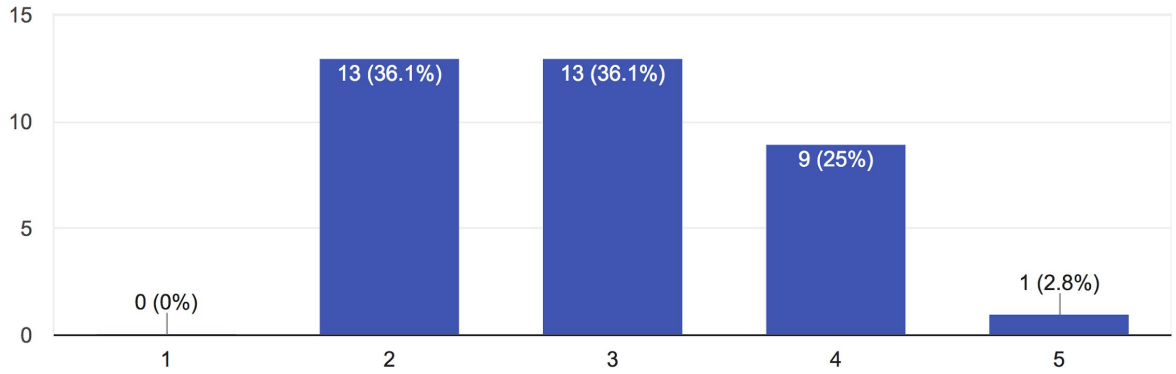


Introductions | Survey Says...

How would you rate your experience with troubleshooting computer problems?

36 responses



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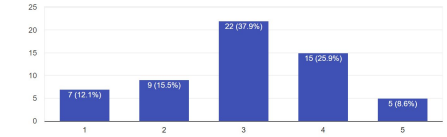
How would you rate your experience with troubleshooting computer problems?

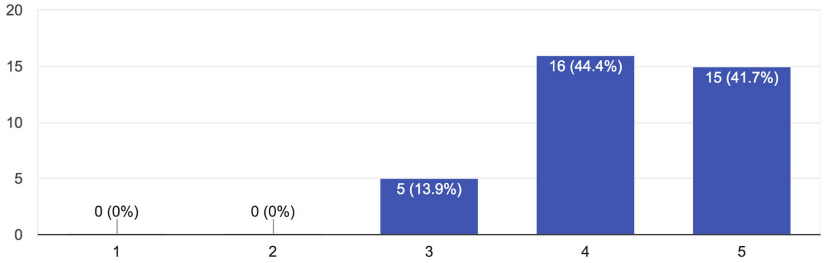
58 responses



Introductions | Survey Says...

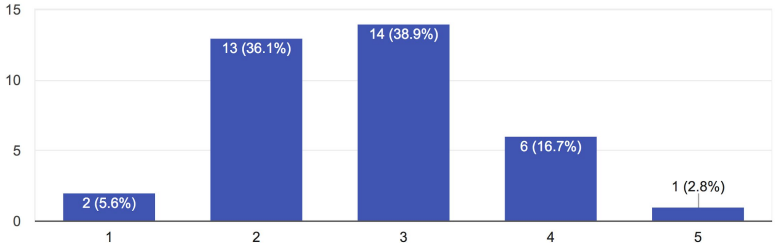
How would you rate your experience with excel?

36 responses



How would you rate your experience with programming?

36 responses



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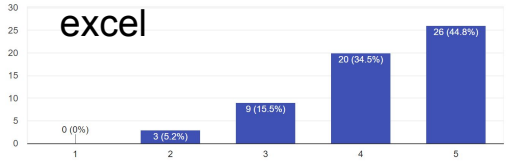
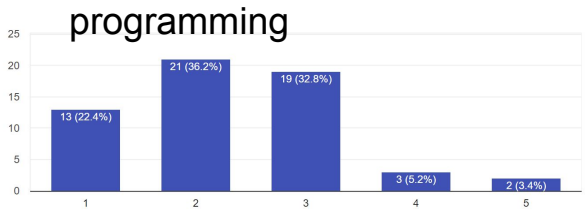
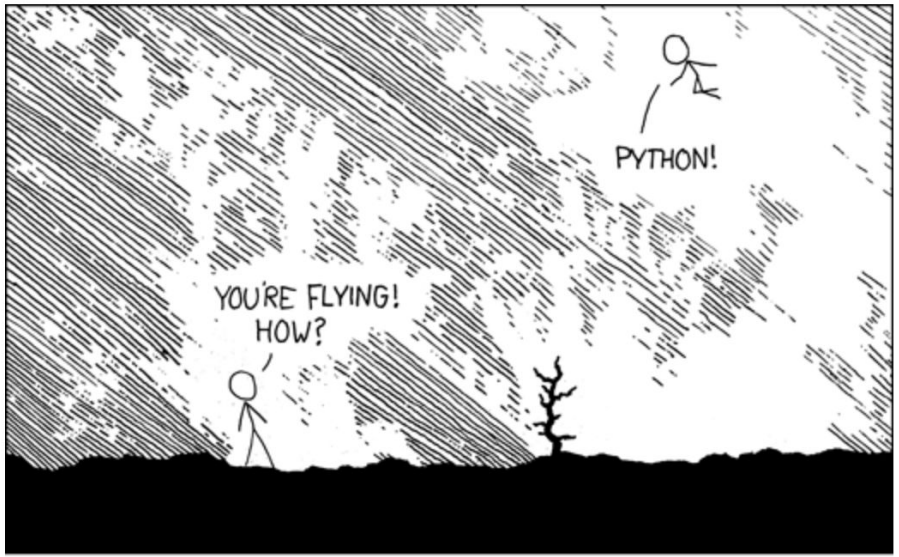




Expectations

- Homework assignments take ~10 hours to complete
  - Depending on your coding experience this could be more or less
- Assignments are due @ 11:59 PM PST the day before this live session
- Late policy:
  - 50% penalty per day late policy
  - Assignments cannot be accepted after the live session in which the assignment is discussed
  - If an emergency, please email instructor and the TA!

Recursive (periodically recurring)



http://www.sweatbeforesix.com/the-workouts/jack-lalanne-sb46-hof

https://xkcd.com/353/

Assignment Help

- There are many avenues to aid students:
  - Google search for the error message or problem - stack overflow is a good coding help resource.
  - Google group email with fellow students - please don’t share code though!
  - Come to Instructor Office Hours – times will be emailed
  - Email the instruction team – please include all of us on your email so we can respond faster; you can also email us your code so we can have a look.
- If you are stuck on an issue or problem for more than an hour please reach out for help!

Week 1 | Agenda

Welcome to MIDS! (and ISVC)

Who are you?

Coding Languages

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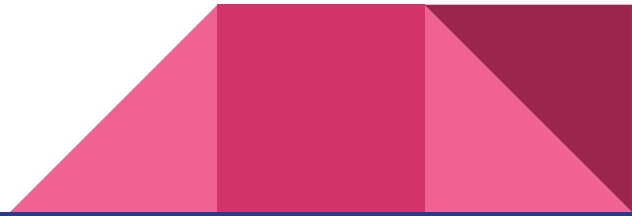
Homework Preview



Coding Languages | Python and Alternatives

Python is a high level interpreted programming language

- Python
- C/C++
- Java
- Perl
- Assembly

Coding Languages | Python and Alternatives

Python can be used for all sorts of data analysis

- Python
- R
- SAS
- Stata
- Excel/VBA

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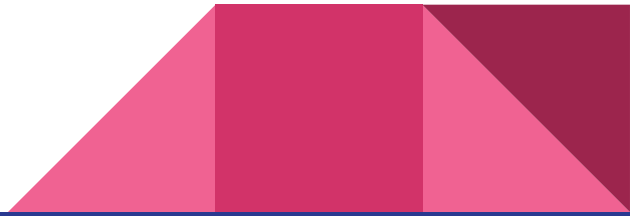

The Command Line | Overview

“Shell”, “Terminal”, “Command Prompt”, “Git Bash”

In this class, Mac and Unix users will use “Terminal”

Windows users will use “Git Shell” (or powershell or CMD)

- We want you to be able to do
  - 1) basic bash scripting
  - 2) launch jupyter notebooks and
  - 3) use virtual environments

The Command Line | Demo

- pwd
- cd, ls
- mkdir,
- echo ">>", cat
- “up arrow” and “tab”
- echo ">", cat
- mv
- cp
- rm
- example into directory

The Command Line | Bash Script

Demo changing commands into bash script (as time allows)

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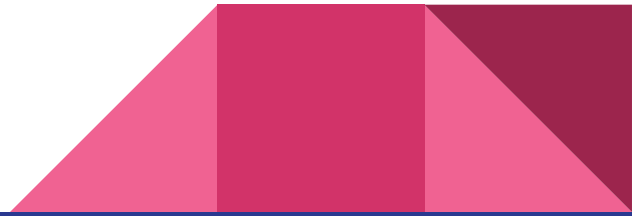


Git and GitHub | Mini-Agenda

Git vs. GitHub

Git

GitHub

Pushing to GitHub

Merge Conflicts

Git and GitHub | Big Picture

What is the difference between Git and GitHub?

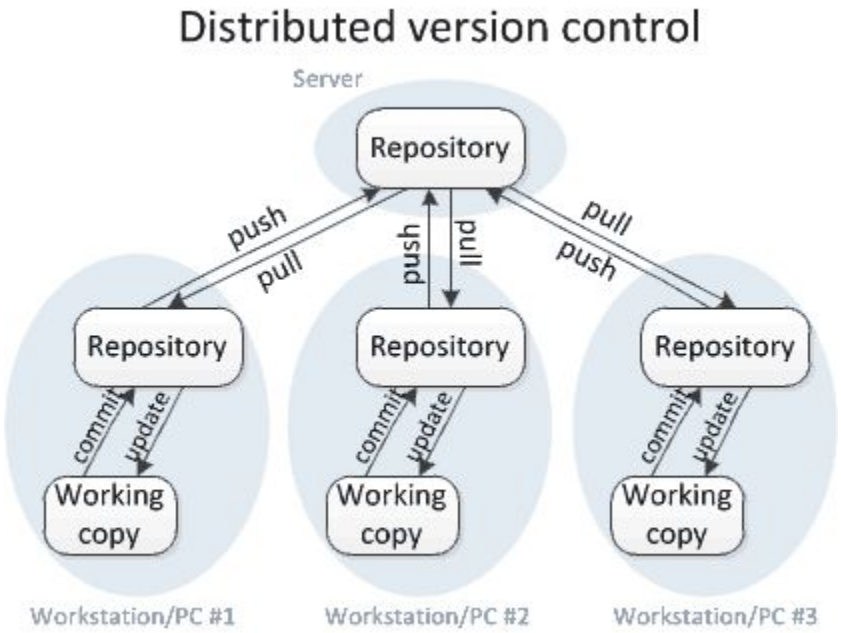
Git and GitHub | Big Picture

What is the difference between Git and GitHub?

- Git is *local* version control. You can use Git by yourself.
- GitHub is an *online way* to sync Git version control across machines. Certain “git” commands communicate with GitHub.

Some companies use their own internal GitHub like software.

Git and GitHub | Distributed Version Control



Git and GitHub | Git Init

Show example of git init

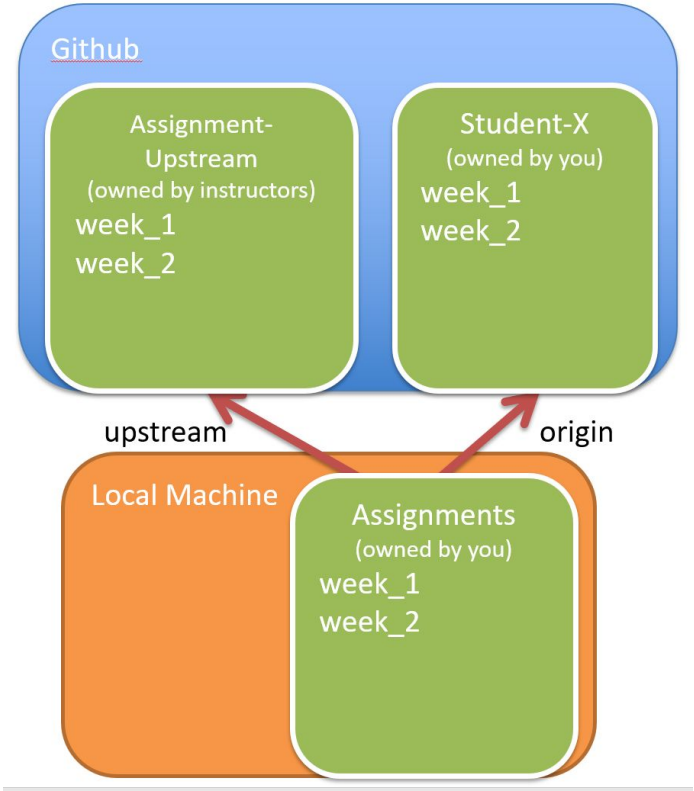
Git and GitHub | GitHub

Show how to browse course repositories on GitHub

The Homework Folders - Three Ways

The GitHub Playground - Two Way (more traditional)

Git and GitHub | GitHub



Git and GitHub | Pushing to GitHub

Three steps to fully commit and store changes online:

0. Always “**git pull**” before you make changes !

1. git add
2. git commit -m “put your message here!”
3. git push

Use “git status” for help throughout!

Git and GitHub | Merge Conflicts

What if multiple people edit the same file?

Sometimes, there is no conflict.

> *You edit lines 1-30.*
>
> *Your friend edits lines 70-100.*

But what if you both edit the same lines?

Merge conflicts must be resolved manually.

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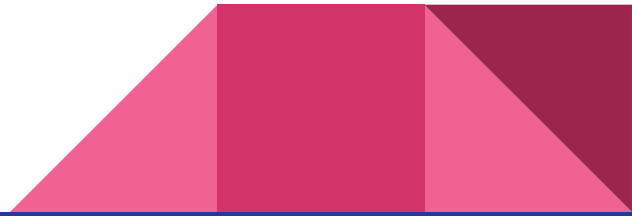

Homework Preview | Overview

Create folders and files via the command line.

Connect to a new GitHub repository and edit a file.

Homework Preview | Tricky Spots

You will be asked to create a “bash script”

Other people will be editing the same file - which will lead to “merge conflicts”

Homework Preview | Bash Script

A bash script is just a small program that can be run from the command line. It is made up of command line commands (same as in terminal).

On a Mac “.sh”

On Windows “.bat”

You will get to play with and figure out the details from here.

Homework Preview | Merge Conflicts

We want you to work on a file that others are working on as well.

You will likely to run into merge conflicts especially if you wait until the last minute

There is information in the lecture and installation files which show you how to resolve ***some*** conflicts.