GE01 Python, Pair Programming and Version Control

Effort: Collaborative Assignment CS3300 Academic Integrity (Pairs)

REQUIREMENT: At least 20 minutes of pair programming with someone else.

Points: 40 (see rubric in canvas)

Deliverables: DO NOT UPLOAD A ZIP FILE and submit word or pdf files.

- **Upload this document with your answers**
- **A screencast video of your pair programming activity**
- **Resume and interview questions**

Due Date: See Canvas

Goals:

- Communicate effectively in a variety of professional contexts within a team, with customers, creating oral or written presentations, and technical documents.
- Devotion to lifelong learning: Prepare to learn on their own whatever is required to stay current in their chosen profession, for example, learning new programming languages, algorithms, developmental methodologies, etc.
- Utilize pair programming to begin learning python.

Names of the person you collaborated

Craig Lillemon

Description: Learning how to learn new technologies. This is not about getting everything working perfectly the first time but collaborating, communicating, finding resources and problem solving with others. Most of all do not panic if you run into issues. Note the issues and how you resolved them.

Think about what information is helpful to have for the next time you do this.

Find 4 or more resources that could be valuable for a new person getting started with python and version control.

Brief description	**Resource**
Geeksforgeeks intro to virtual environments and python specifically - easy to understand and quick.	https://www.geeksforgeeks.org/python-virtual-environment/
A Google for Education full course walkthrough of python with lecture videos and text.	https://developers.google.com/edu/python/introduction
Broad but concise intro to version	https://homes.cs.washington.edu/~mernst/advice/version-contro

control and best practices. Also includes some git commands with explanations.	l.html
Longer walkthrough of git command line with decent in-depth explanations.	https://www.youtube.com/watch?v=e5wY8G00OfI
Explains git and github, and the difference between the two	https://devmountain.com/blog/git-vs-github-whats-the-difference/#:~:text=Simply%20put%2C%20Git%20is%20a,help%20you%20better%20manage%20them.
Git command cheat sheet	https://education.github.com/git-cheat-sheet-education.pdf

Start exploring git, github, command line, and python in a virtual environment.

1 Python and IDE

Set up your python and IDE for your python development.

Install Python

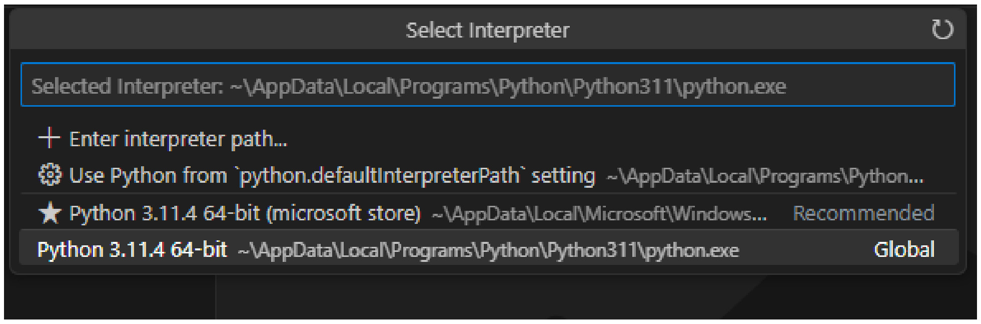
1. Open the command window and check your python version to see if you have it installed.
2. Install python version 3.11 Download Python. If on windows and have older version of python you should uninstall first : How to Uninstall Python

Install VS Code IDE

You can use a different IDE but this is what I will be using in my lectures. This has nice tools to integrate with python, django and databases.

https://code.visualstudio.com/download

1. Configure the Python interpreter: In Visual Studio Code, open the Command Palette by pressing `Ctrl+Shift+P` (Windows/Linux) or `Cmd+Shift+P` (Mac). Search for "Python: Select Interpreter" and choose the Python interpreter associated with your virtual environment (e.g., `myenv`).

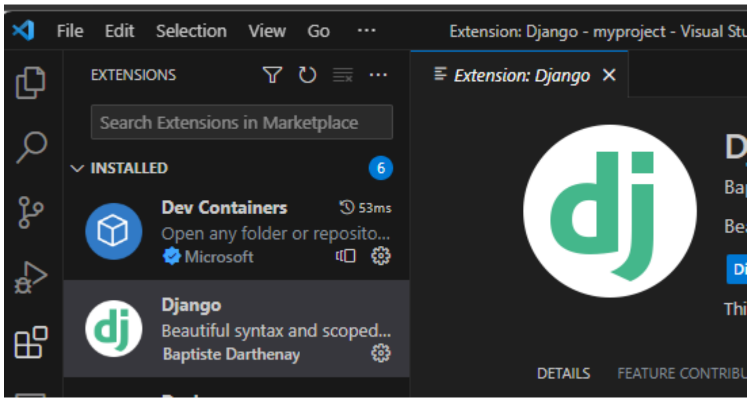


Select Interpreter

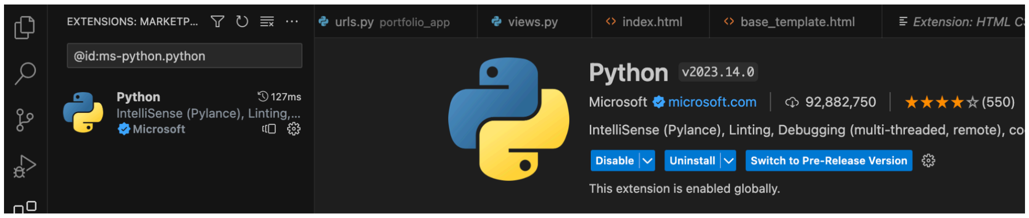
Selected Interpreter: ~\AppData\Local\Programs\Python\Python311\python.exe

+ Enter interpreter path...
Use Python from `python.defaultInterpreterPath` setting ~\AppData\Local\Programs\Python...
★ Python 3.11.4 64-bit (microsoft store) ~\AppData\Local\Microsoft\Windows... Recommended
Python 3.11.4 64-bit ~\AppData\Local\Programs\Python\Python311\python.exe Global

2. Install the Django extension developed by Baptiste Darthenay: In Visual Studio Code, go to the Extensions view and search for the "Django" extension. Install it to benefit from Django-specific features and enhancements for what we will be doing later.

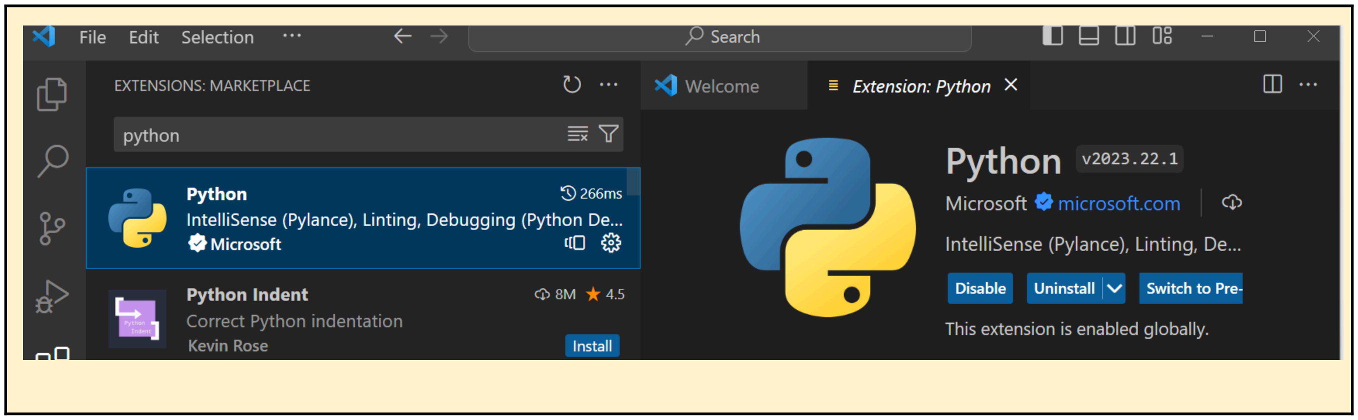


File Edit Selection View Go ···
Extension: Django - myproject - Visual Stu
EXTENSIONS
Search Extensions in Marketplace
INSTALLED 6
Dev Containers 53ms
Open any folder or reposito...
Microsoft
Django
Beautiful syntax and scoped...
Baptiste Darthenay
Extension: Django
DETAILS
FEATURE CONTRIBU



EXTENSIONS: MARKETP...
@id:ms-python.python
Python 127ms
IntelliSense (Pylance), Linting,...
Microsoft
urls.py portfolio_app
views.py
index.html
base_template.html
Extension: HTML C
Python v2023.14.0
Microsoft microsoft.com 92,882,750 ★★★★☆ (550)
IntelliSense (Pylance), Linting, Debugging (multi-threaded, remote), co
Disable
Uninstall
Switch to Pre-Release Version
This extension is enabled globally.

3. You can use this to edit your python file for practice.
4. Take a screenshot of the ide you have set up and the python file from the repository once you edit it below.



2 Pair Programming

Goal: Improve software quality by having multiple people develop the same code.
Setup:

- One shared computer, alternate roles
- Driver: Enters code while vocalizing work
- Observer: Reviews each line as it's typed, acts as safety net + suggest next steps

Effects:

- Cooperative, a lot of talking! + Increases likelihood that task is completed correctly
- Also transfers knowledge between pairs

Start learning the basics by going through Hello, World! - Free Interactive Python Tutorial by following the instructions below.

- You should spend at least 20 minutes pair programming
- Choose video screen-recording software that you can use to capture your discussion and screen. (such as https://obsproject.com/)

Where it says exercise code: that means for that section you are doing the exercise at the end of the information.

- Do not copy the solution code. Instead copy your code and paste below. Add any notes that would be helpful.
- Do not worry if you do not finish all the parts when pair programming but you should start pair programming and videoing with lists.
- Complete on your own after the pair programming ends.

Scan the following sections before pair programming. Take turns summarizing each section to the other. Add any brief notes or examples.

Hello, World!

Variables and Types

Lists Review and complete exercise code:

```
numbers = []
strings = []
names = ["John", "Eric", "Jessica"]

# write your code here
second_name = names[1]
numbers.append(1)
numbers.append(2)
numbers.append(3)
strings.append("Hello")
strings.append("world")

# this code should write out the filled arrays and the second name in the names list (Eric).
print(numbers)
print(strings)
print("The second name on the names list is %s" % second_name)
```

Basic Operators Review and complete exercise code:

```
x = object()
y = object()

# TODO: change this code
x_list = [x] * 10
y_list = [y] * 10
big_list = x_list + y_list

print("x_list contains %d objects" % len(x_list))
print("y_list contains %d objects" % len(y_list))
print("big_list contains %d objects" % len(big_list))

# testing code
if x_list.count(x) == 10 and y_list.count(y) == 10:
    print("Almost there...")
if big_list.count(x) == 10 and big_list.count(y) == 10:
    print("Great!")
```

Scan the following sections. Take turns summarizing each section to the other. Add any brief notes or examples.

Basic Operators

Math based, includes some lists

String Formatting

Similar to C % operator %s represents string and % represents integer

Basic String Operations

Ways to count string length, how many letters and so on

Conditions

Boolean operators, ==, less and greater, if and else, not

Loops

For loops, while, do while loops, break and continue

Functions Review and complete exercise code:

```
# Modify this function to return a list of strings as defined above
def list_benefits():
    strings = ["More organized code", "More readable code", "Easier code reuse", "Allowing
programmers to share and connect code together"]
    return strings

# Modify this function to concatenate to each benefit - " is a benefit of functions!"
def build_sentence(benefit):
    return benefit + " is a benefit of functions"

def name_the_benefits_of_functions():
    list_of_benefits = list_benefits()
    for benefit in list_of_benefits:
        print(build_sentence(benefit))

name_the_benefits_of_functions()
```

Classes and Objects Review and complete exercise code:

```
# define the Vehicle class
class Vehicle:
    name = ""
    kind = "car"
    color = ""
    value = 100.00
    def description(self):
        desc_str = "%s is a %s %s worth $%.2f." % (self.name, self.color, self.kind, self.value)
        return desc_str
# your code goes here

car1 = Vehicle()
car1.name = "Fer"
car1.color = "red"
car1.value = 60000

car2 = Vehicle()
car2.name = "Jump"
car2.kind = "van"
car2.color = "blue"
car2.value = 10000


# test code
print(car1.description())
print(car2.description())
```

Dictionaries Review and complete exercise code:

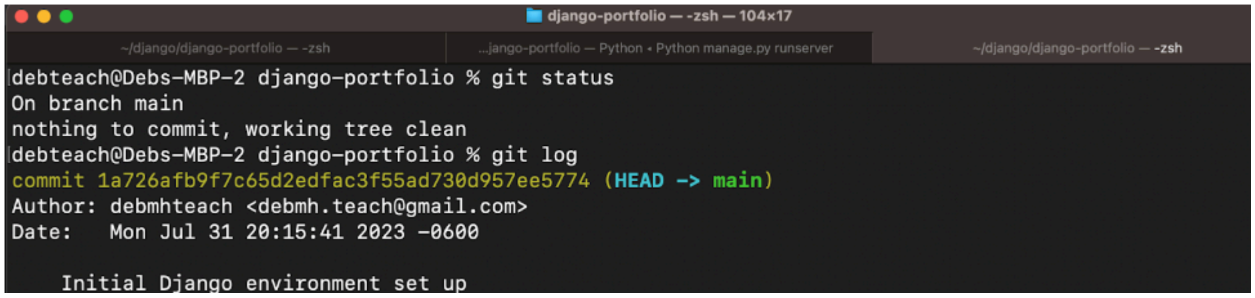
```
phonebook = {
    "John" : 938477566,
    "Jack" : 938377264,
    "Jill" : 947662781
}
# your code goes here
del phonebook["Jill"]
phonebook["Jack"] = 938273443
# testing code
if "Jake" in phonebook:
    print("Jake is listed in the phonebook.")

if "Jill" not in phonebook:
    print("Jill is not listed in the phonebook.")
```

3 Version Control

Set-up git and github repository

Use the command line tool of your preference in your environment. I ended up using command prompt on my windows but also have used windows powershell.I use the generic command tool on my mac. Here is an example of using the default command prompt



```
debteach@Debs-MBP-2 django-portfolio % git status
On branch main
nothing to commit, working tree clean
debteach@Debs-MBP-2 django-portfolio % git log
commit 1a726afb9f7c65d2edfac3f55ad730d957ee5774 (HEAD -> main)
Author: debmhteach <debmh.teach@gmail.com>
Date:   Mon Jul 31 20:15:41 2023 -0600

    Initial Django environment set up
```

django-portfolio — -zsh — 104×17
~/django/django-portfolio — -zsh
...jango-portfolio — Python ◂ Python manage.py runserver
~/django/django-portfolio — -zsh

Research

- What is git and github? What does git provide? What does github provide?
- How can you create a github repository from a local folder?
- What documentation could be useful to help understand the commands?

Include resources in the table above.

1. Create a python file in a local folder cs3300-version-practice
2. Create a folder called documentation in cs3300-version-practice that contains this document.
3. Create a github account if you do not have one.
4. Create a github repository that is public from the local folder.

   Explain what you did and the commands you used.

   Paste a screenshot of your local directory code

   Paste a screenshot of your github repository code

   Paste the url to you github repository code

5. You may need to generate an SSH Key pair to configure remote access to your repositories. Github's instructions for this process can be found here.
6. You may need to set

```
git config --global user.email "you@email"        (email associated with repository)
git config --global user.name "Your Name
```

Add, Commit, Push Practice

1. You can just work with updating a python file.
    1. Check the git branch and status

```
git branch
git status
```

2. Update the file. Before you can commit the version you must add the new file to the index (the staging area)

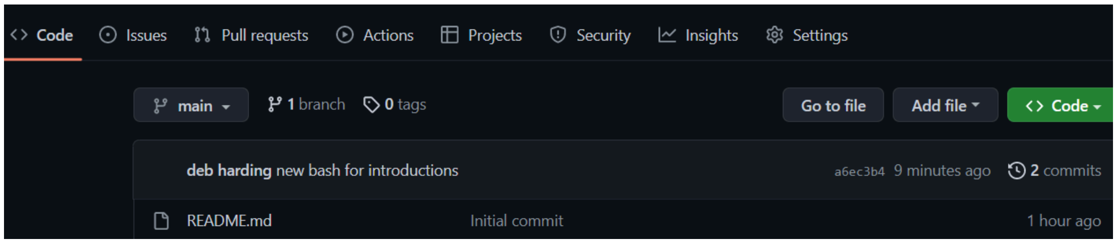
```
git add .
git status
```

3. Record changes to the local repository with a description but first you might need to include the author identity. Then check the status

```
git commit -m 'add description'
git status
```

4. You will add your code, commit and push. Then explore the repository on the remote server, github

```
git push
git status
```



deb harding new bash for introductions a6ec3b4 9 minutes ago 2 commits

README.md Initial commit 1 hour ago

Branching

1. From the command line in your repository on your computer check the log and what branch you are on.
2. Create a branch called sprint01 and check the log and branch
   Copy and paste the commands you used

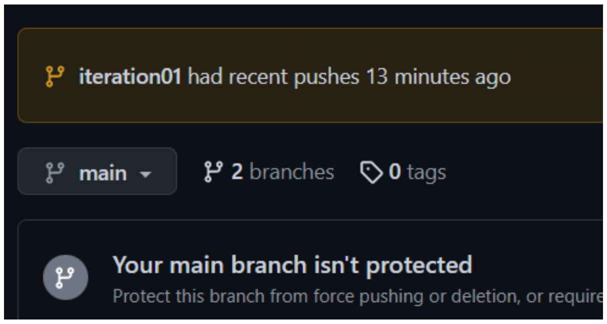
3. Switch to sprint01 branch to check out code:

   git checkout 'sprint01'
   git branch
   git status

4. Modify python file and Add the file to the staging area and update the version in your local directory.
   Copy and paste the command(s) you used

5. Share the changes with the remote repository on the new sprint01 branch. Go to your github and you will see you now have two branches. Click to view the branches. Now others working on the branch could pull your updates from the sprinto1 branch.

   git push --set-upstream origin sprint01
   git status
   git log



iteration01 had recent pushes 13 minutes ago

Your main branch isn't protected

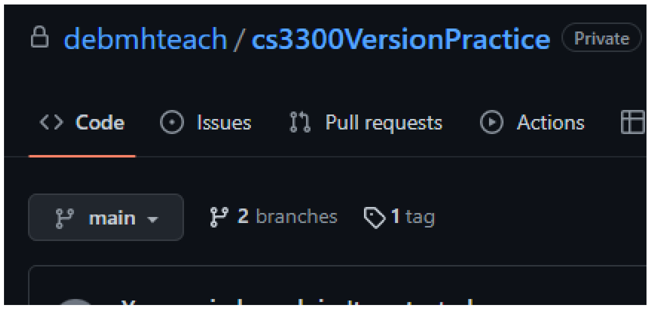
Protect this branch from force pushing or deletion, or require

6. Switch to the main branch and update the remote main branch repository with the change from sprint01 branch. Then go to github to see the versioning.

   Copy and paste the commands you used

7. Tag the main branch ‘v1.0’ then view the tag and push to the remote repository. When you go to the remote repository you should see the tag listed.
Copy and paste the commands you used

For example



Version Control Concepts

Individually answer each question in your own words, **including any resources you used to help you above.** This will be helpful when you keep technical documentation with your team. **You can use AI to help you understand but answer in your own words.**

3.1 Explain software version control. Address in your description branches, commits, merges, tags.

3.2 Research what Git is and what its relationship is to software version control. Include how GitHub integrates with git.

3.2 Explain the following commands and include examples: commit, pull, push, add, clone, status, log, checkout

3.3 Explain the difference between a branch and a tag.

3.4 Describe at least three benefits of a version control system and include an example for each that would be related to industry.

4 Resume and Interview Questions

Create a document that contains the following parts

Part 1: Create a resume to use to interview to be a full stack developer intern that only includes these sections

1. Summary
2. Skills
3. Relevant Experience

Part 2: Interview questions you would ask to see if someone would be a good fit on your team. Include at least 4 questions.