Week 10 Lab: Vibe Coding (and setting up GitHub Codespaces)

Introduction

In this assignment, you will use **VIBE (Visual Interactive Based Education)** - an AI-powered coding assistant - to help you build a Python program. This assignment teaches you how to effectively communicate with AI tools to solve programming problems. In the modern workplace, knowing how to work with AI assistants is becoming an essential skill for programmers.

What you'll learn:

- How to write clear, specific prompts for AI coding assistants
- How to review and test AI-generated code
- How to iteratively improve code with AI assistance
- How to identify and fix issues in AI-generated code
- Best practices for human-AI collaboration in programming

Important: *You are expected to use VIBE for this assignment. The goal is to learn how to effectively work WITH AI tools, not to avoid them.*

LEARNING OBJECTIVES

By completing this assignment, you will demonstrate your ability to:

- Write effective prompts for AI coding assistants
- Review and understand AI-generated code
- Test AI-generated code thoroughly
- Identify errors or improvements needed
- Iteratively refine code through AI interaction
- Document your AI-assisted development process
- Apply programming concepts learned in Weeks 6-9

Assignment Overview

You will use VIBE to create a **Student Grade Calculator** program that:

- Manages student records (name, ID, test scores)

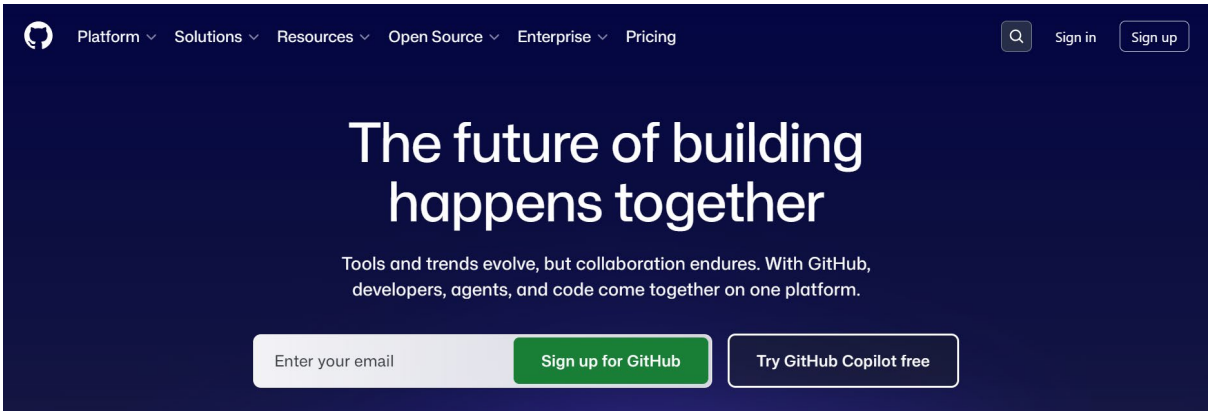
- Calculates averages and letter grades
- Stores data in a file
- Provides search and reporting features
- Uses either dictionaries OR classes (your choice based on comfort level)

This project intentionally reinforces concepts from the Employee Management System project but in a simpler, different context.

Accessing GitHub Codespaces

Step 1

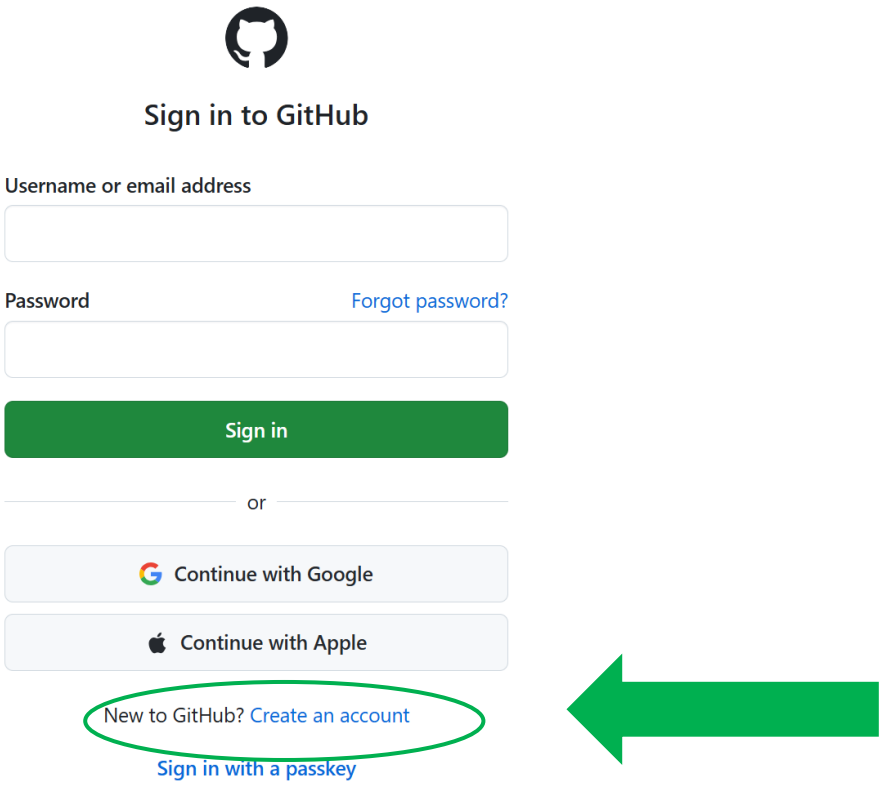
Go to https://github.com/ to access GitHub. Click 'Sign up for GitHub' if you do not have an account or Sign in if you have an existing account.



Create a GitHub Account or Simply sign in

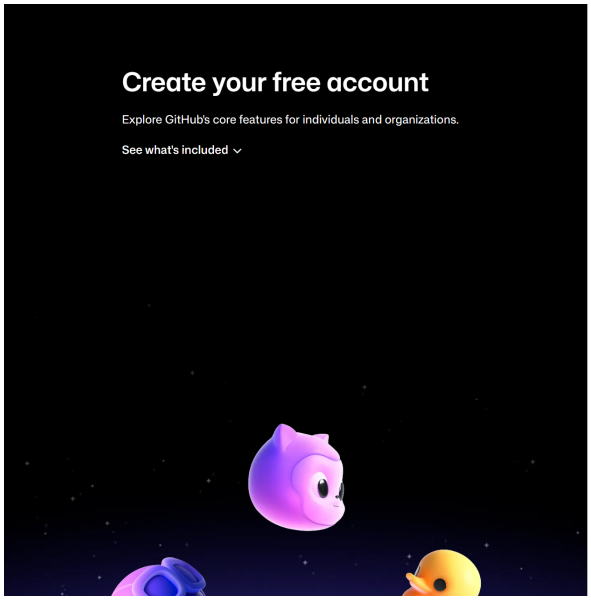
Step 1

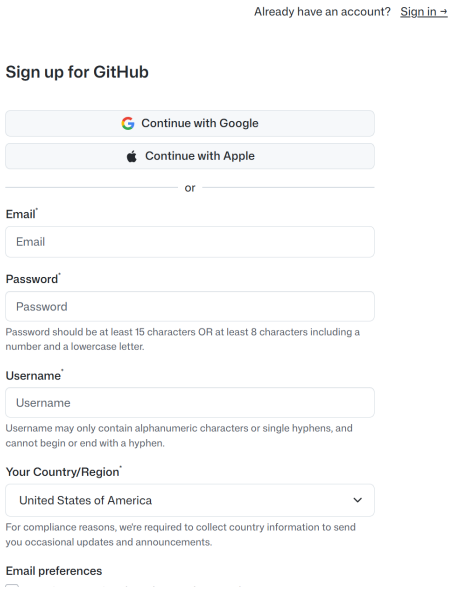
If you are new to GitHub and need to create a GitHub account from the screen pictured, you can click on 'Create an account' below the 'Continue with Apple' option seen in the screenshot below.

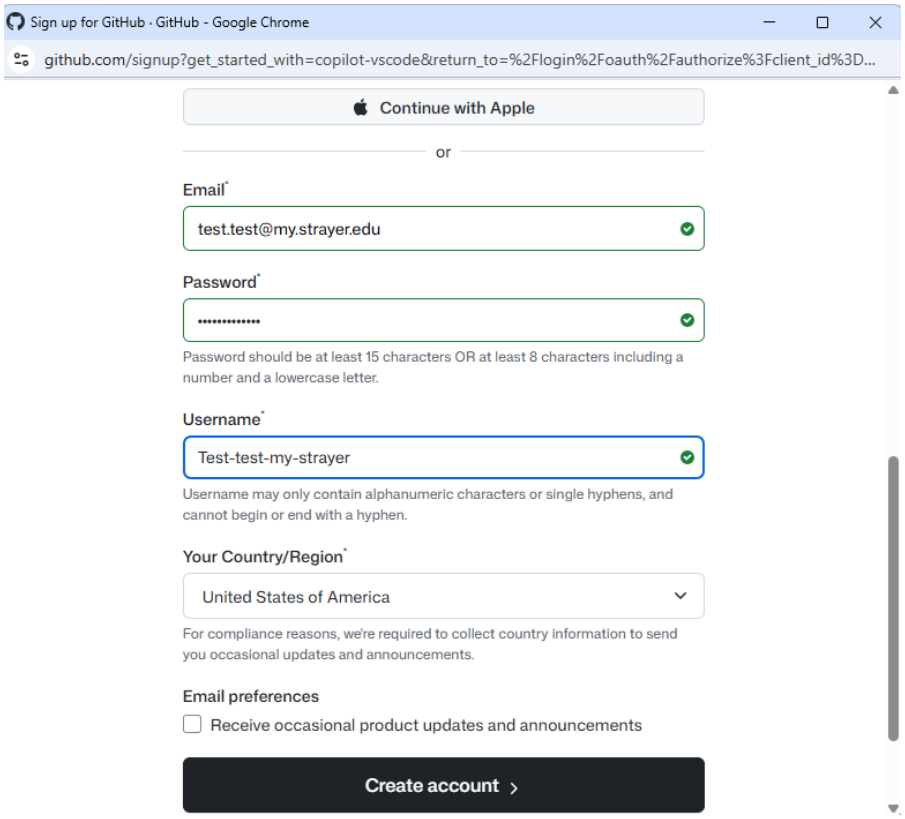


If you have an account, use your sign in options.

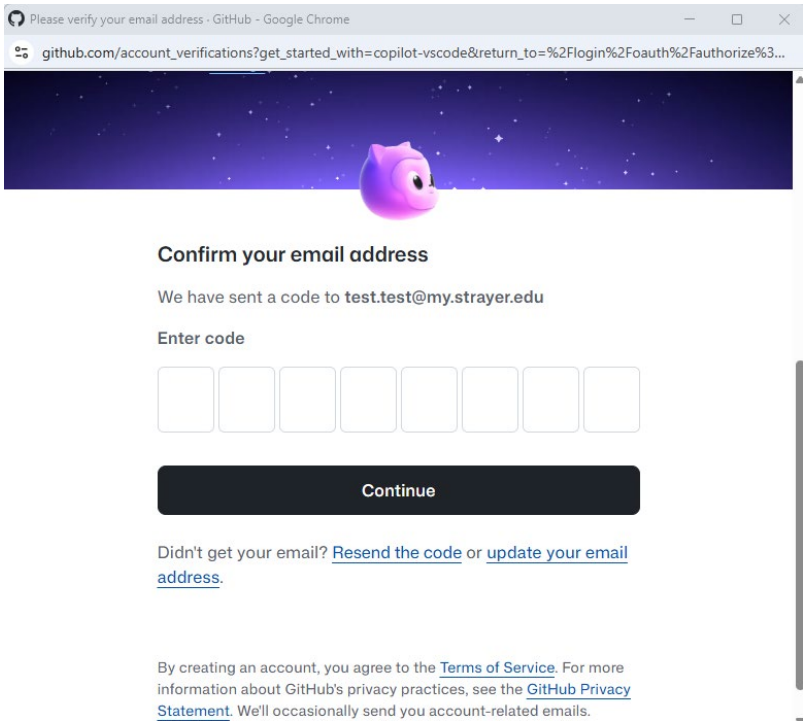
To continue creating a new account with GitHub yiou will then scroll down on the next windwo that appears to fill out your information. It usually easier to sign in with a Google Account if you have one by selecting ‘Continue with Google’. If you do not have a Google Account you will want to maually fill out the information with your Email, Password, Username, Your Country/Region, and then click Create account.



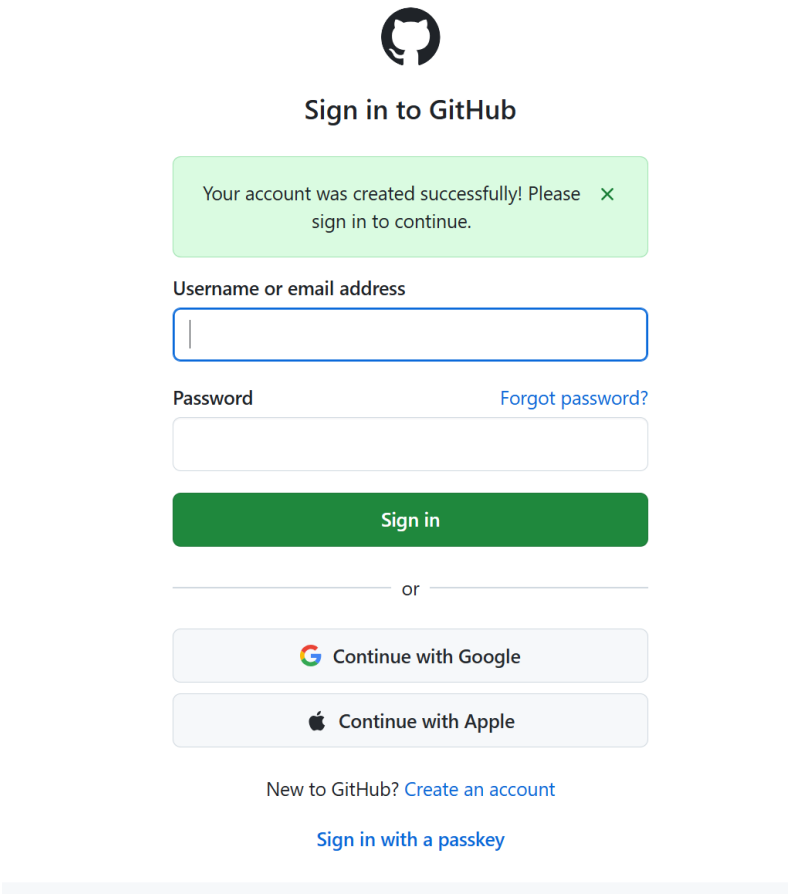




You will then see verify your account. You will be emailed a Code you must then enter into the box provided.



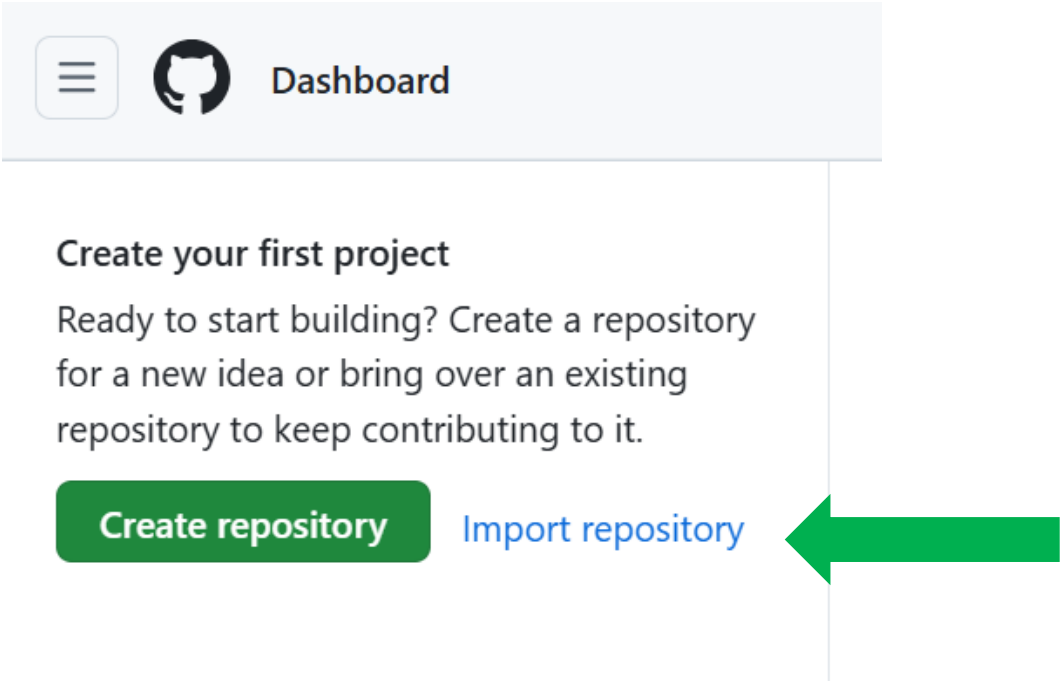
Once verified successfully, you will be prompted to sign in.



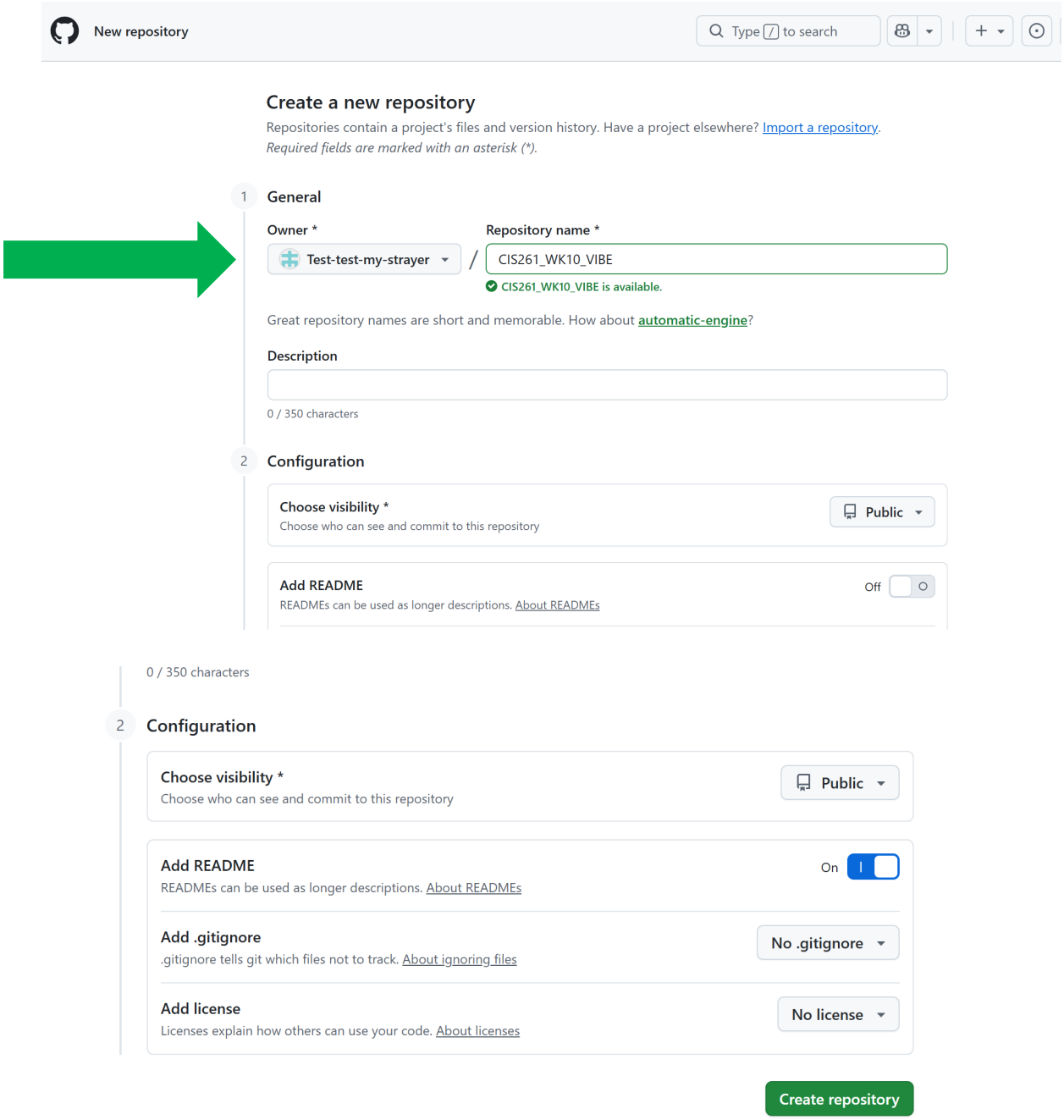
Create first repository in GitHub Codespaces

Step 1

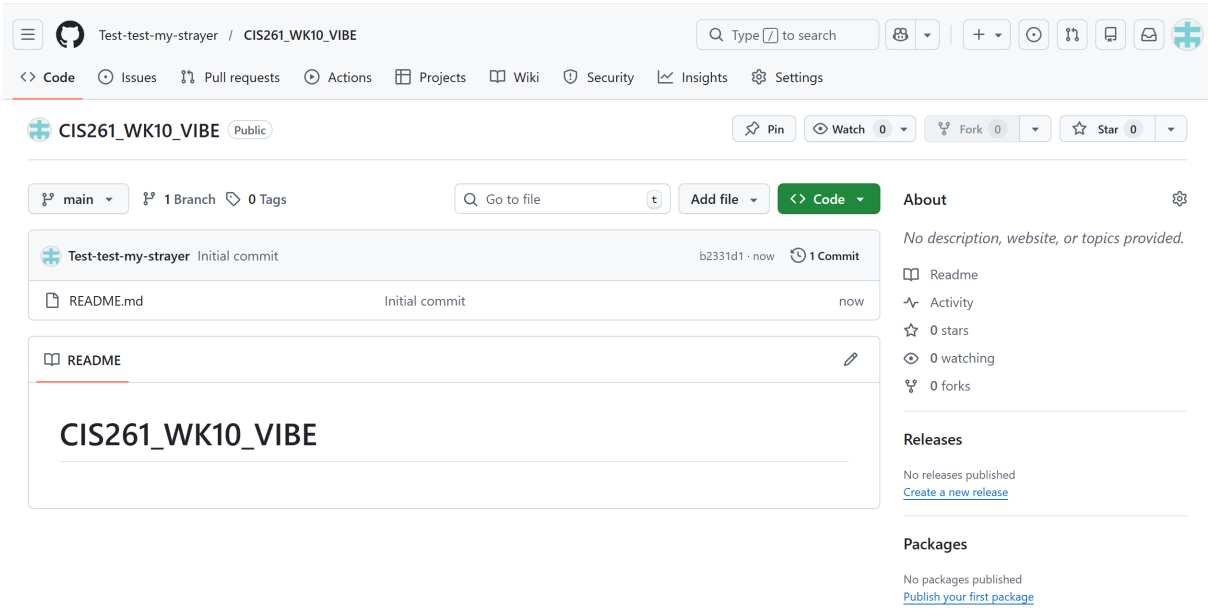
From your GitHub dashboard you can click on Create repository.



Now, we create our repository. We will name this repository CIS261_WK10_VIBE. We will leave this public and select on for the README (This is where you can make longer descriptions of your code, even though we will not use it in this program.)

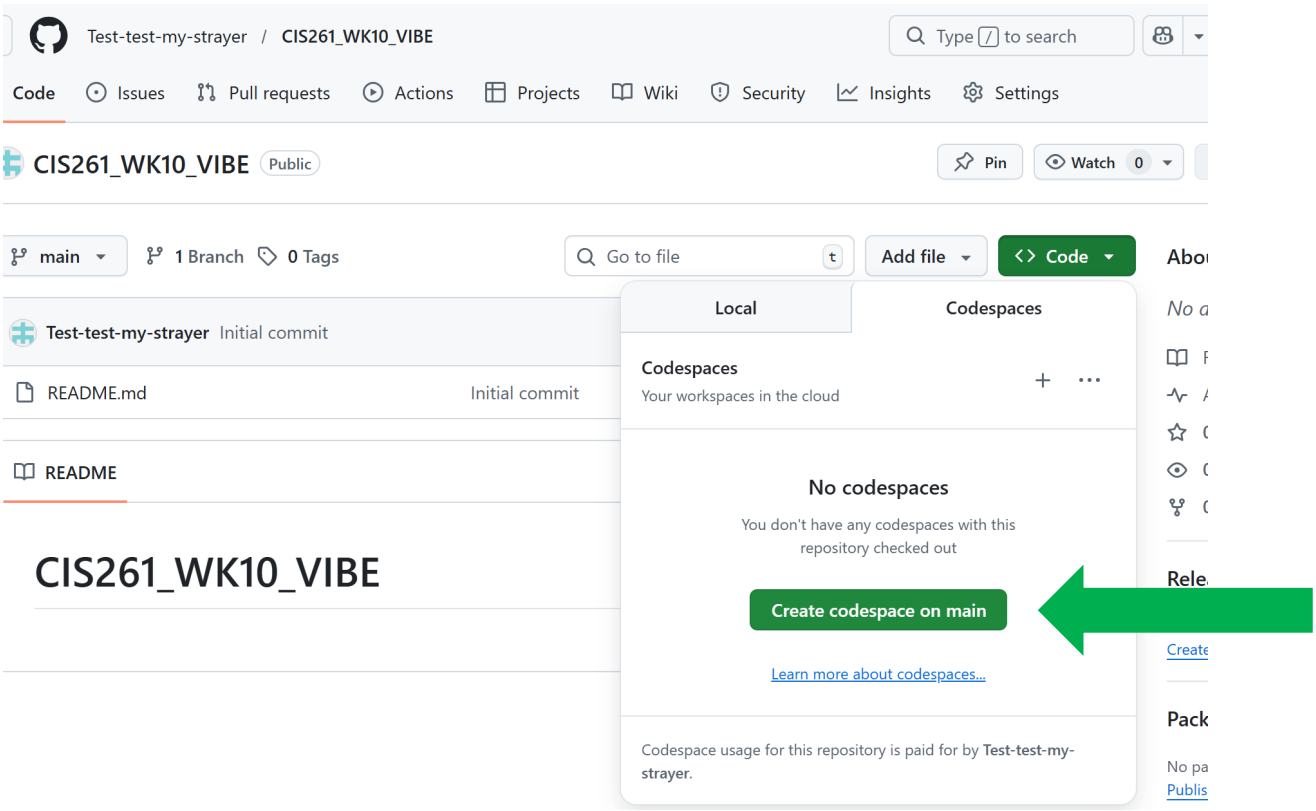


Click ‘Create repository.’ You now have your first repository we will use in codespaces.

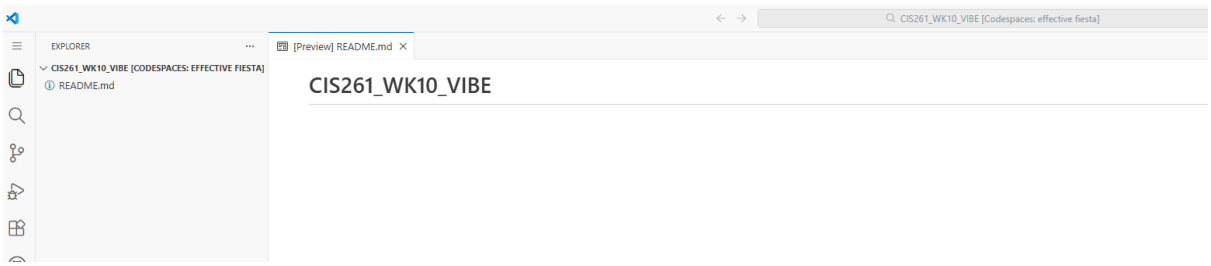


Step 2

From our repository we will click on < >Code, then ‘Create codespaces on main’.



We are now in our Codepaces where we can begin coding.

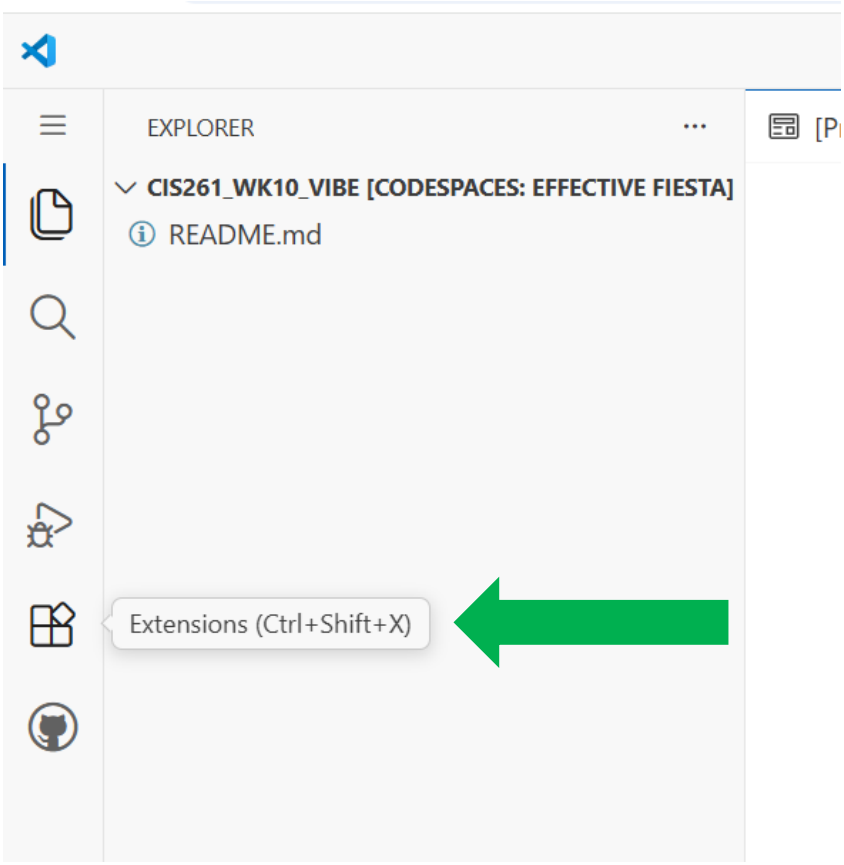


Create our first Python file in Codespaces

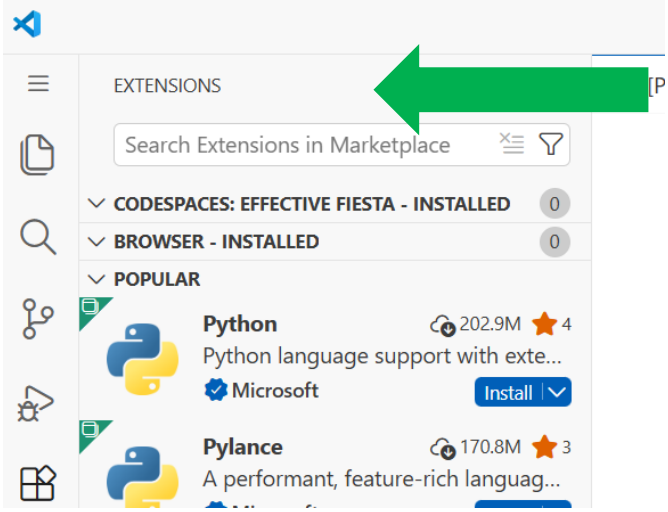
Step 1

We are now in our development environment, this should look very familiar. This is Visual Studio Code development. This is not Visual Studio Code for Education, but the more powerful version. We still have a little setting up to do before we can create our first Python file in the new environment.

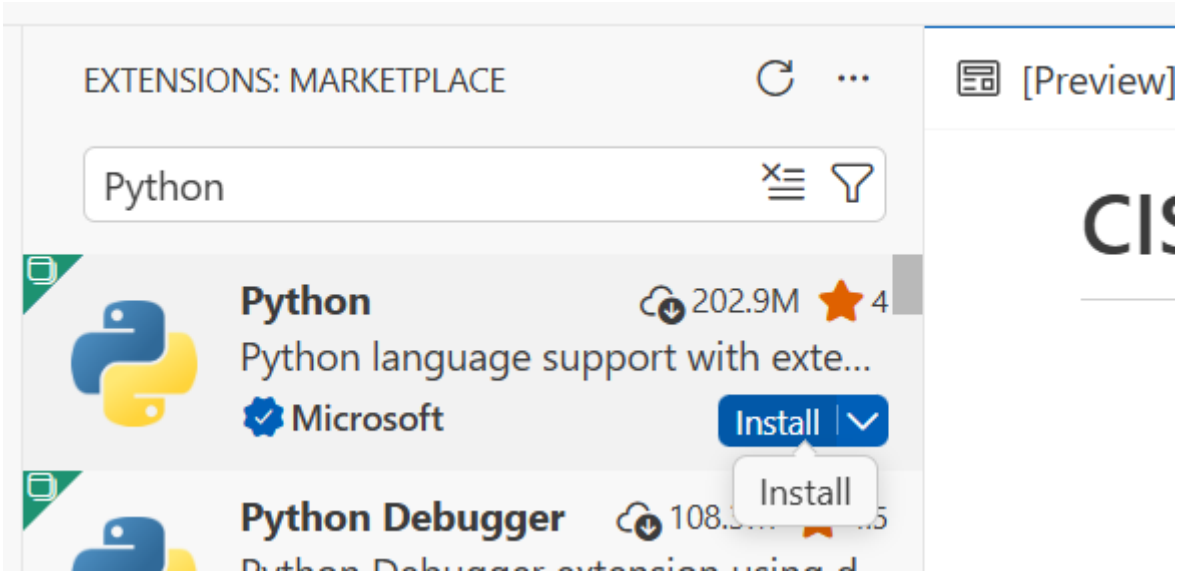
On the left side of the screen you will see an icon that looks like four boxes and one of them turned on it's corner. Click that icon, it is the Extensions icon where we will find and install Python into our environment.



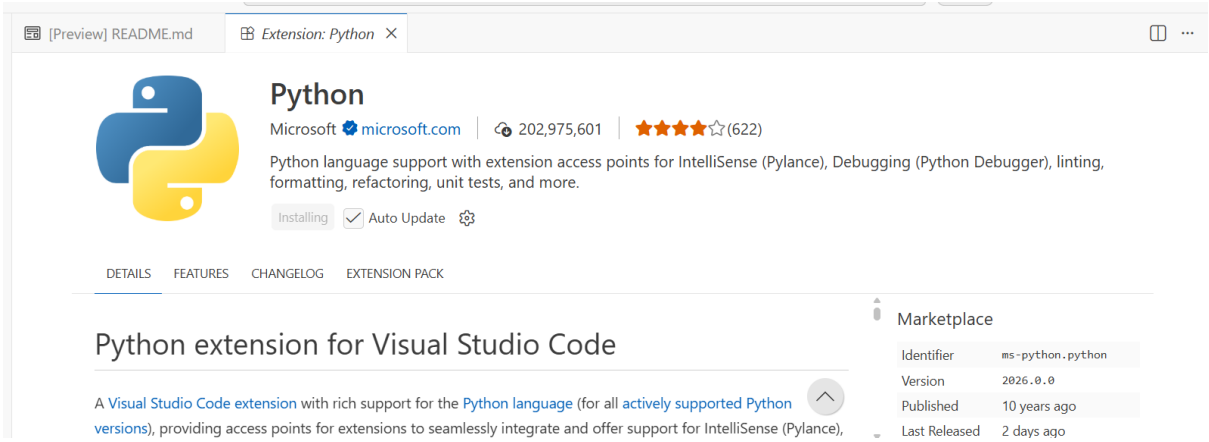
Python may show up as the top extension, but if it doesn't you can search by using the search box where is says 'Search Extensions in Marketplace'.



Now, let's click Install on the Microsoft verified Python Extension

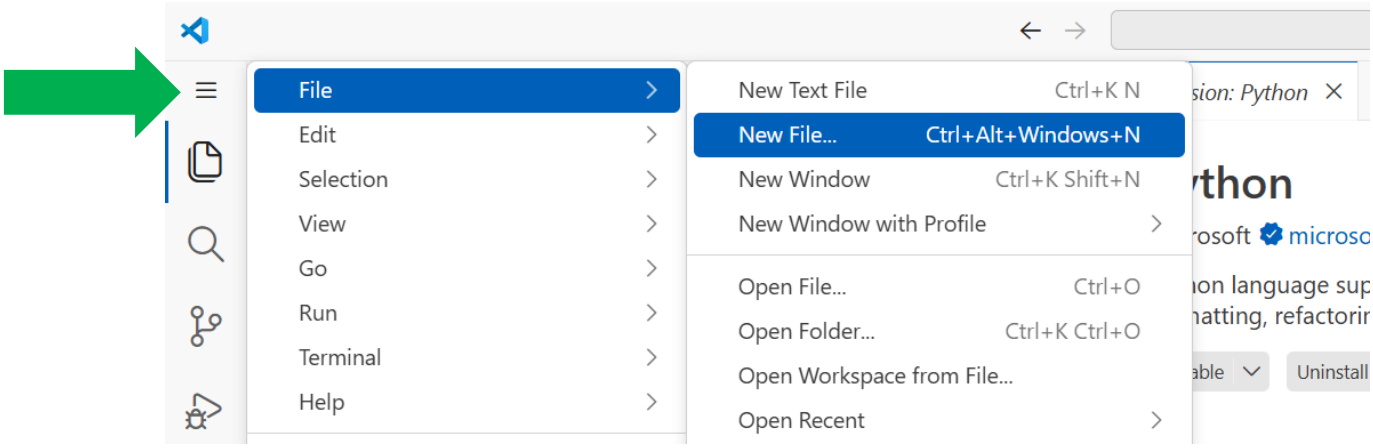


It will then open up another tab in codespaces called Extension: Python.

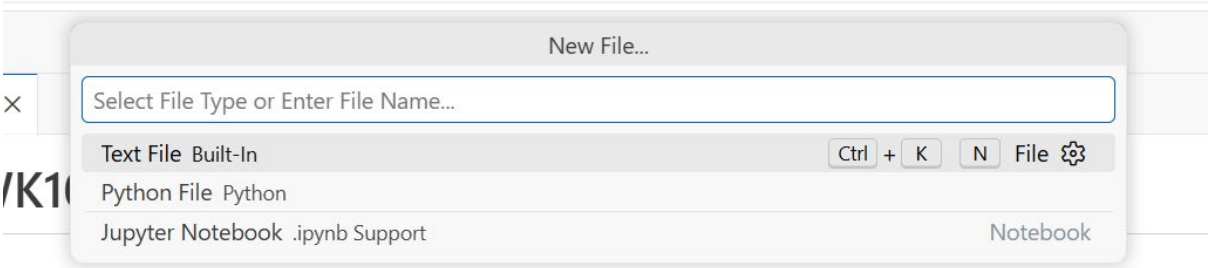


Step 2

Now, we are ready to create our file. Click on the 3 dashes in the top left corner to select File → New File.



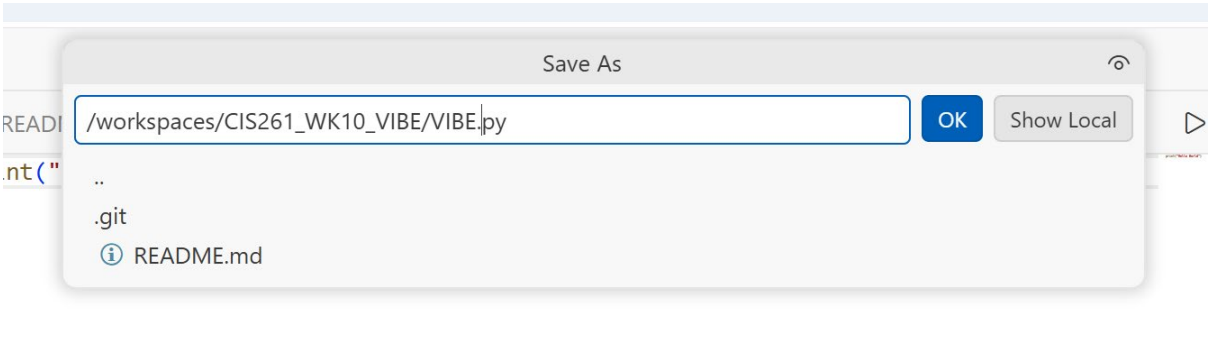
A New File box in the top center will appear. You will select Python File as the option.

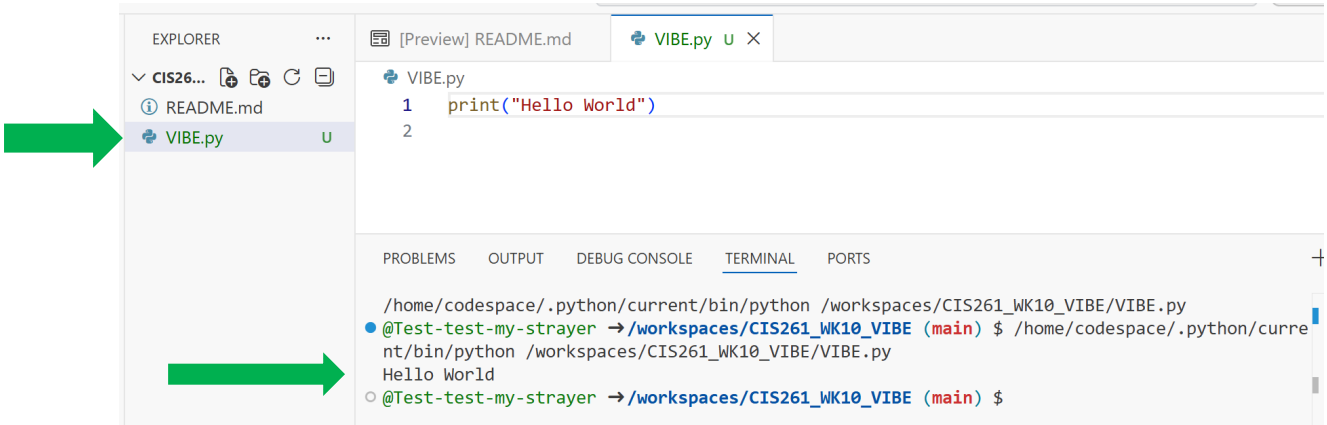


A new tab will open called Untitled at the top of your screen. It will say 1 Generate code (Ctrl+I), or select a language (Ctrl+K M). Start typing to dismiss or don't show this again.



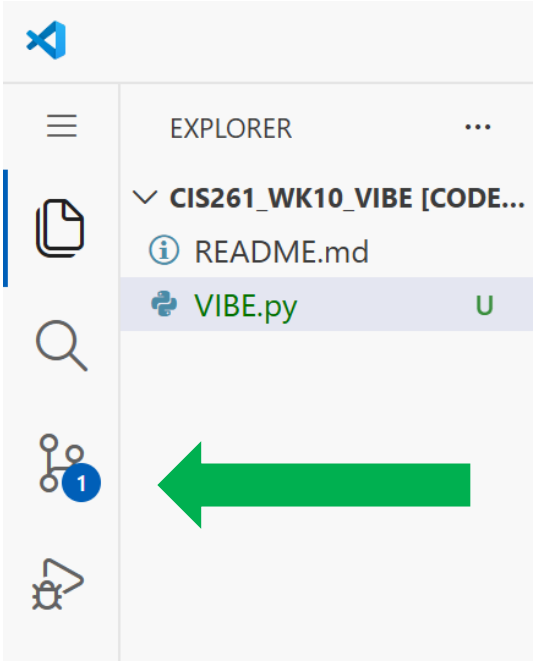
Let's run a simple test. Print("Hello World"). Use the run arrow on the top right of the window to run the program in the terminal. When you click the run arrow it will require you to save your file. Here we will give it a name. *Remember, just like in Visual Studio Code for Education DO NOT REMOVE the .py.* Name the File VIBE, and click OK.



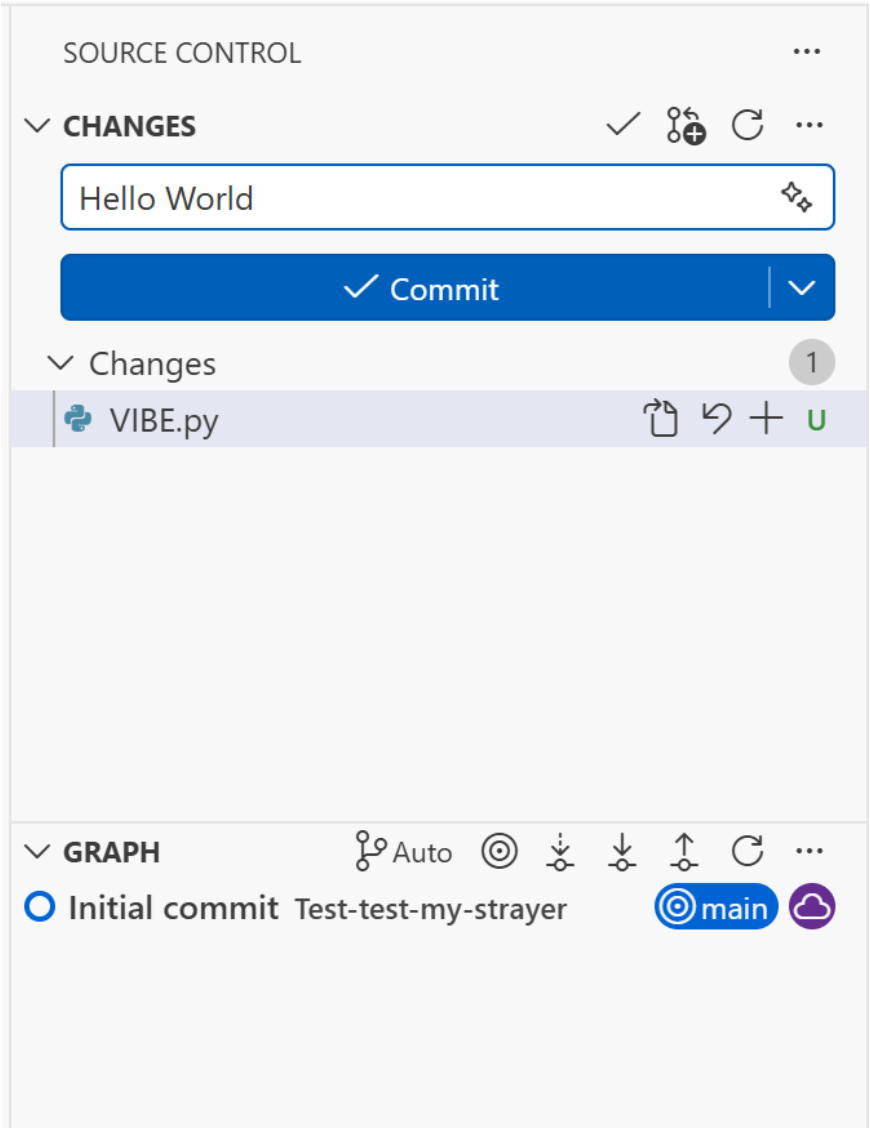


In the terminal you will see that we ran Hello World as our output and we have created our first Python file indicated in the Explorer. \

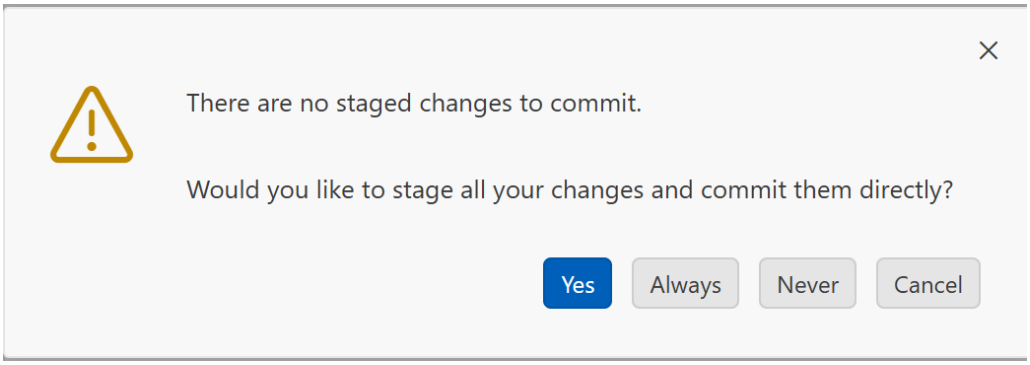
Notice the U to the right of VIBE.py int eh Explorer. This means it is untracked. Remember, we are connected to our personal GitHub accounts and have created a repository or repos as you may see it referred to. We will need to push our program changes to our GitHub repository as we make changes. Look to the far left menu bar and you should see an icon with 1 indicator next to it. It means there is a pending change. Let's rectify that now.



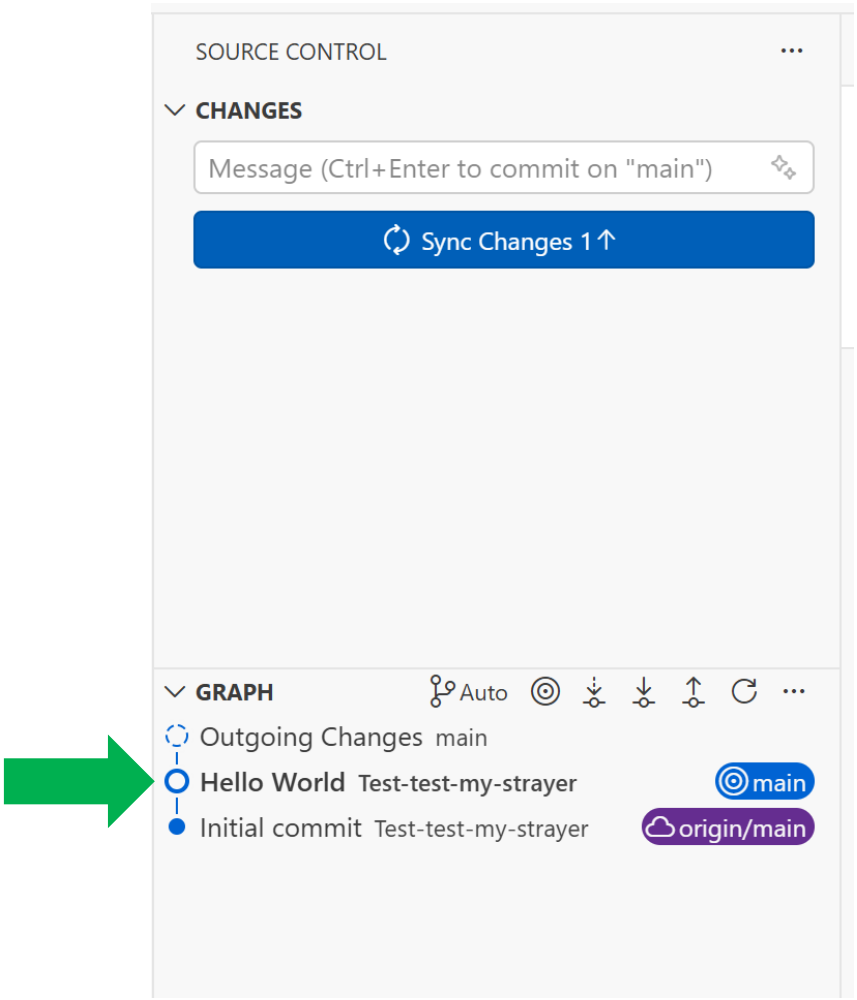
To push the changes we will type a Message in the message box the click Commit. In this case our message will be Hello World.



You will then get a pop-up, we will click Always to commit all stage changes directly. This setting skips the "stage changes" step and automatically commits all modified files. We will still check from time-to-time to ensure all work is being saved. Another fantastic feature is that GitHub Codespaces, **auto-save is enabled by default**. Any changes you make are automatically saved to your virtual machine in the cloud.



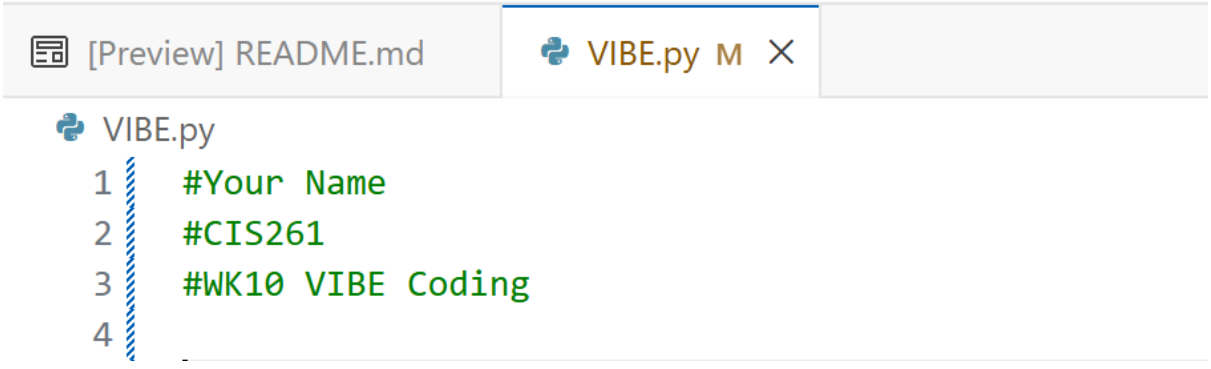
You can now see in Source Control that your changes have been saved and synced. Notice that you can track changes via your messages.



Create our first Python file in Codespaces

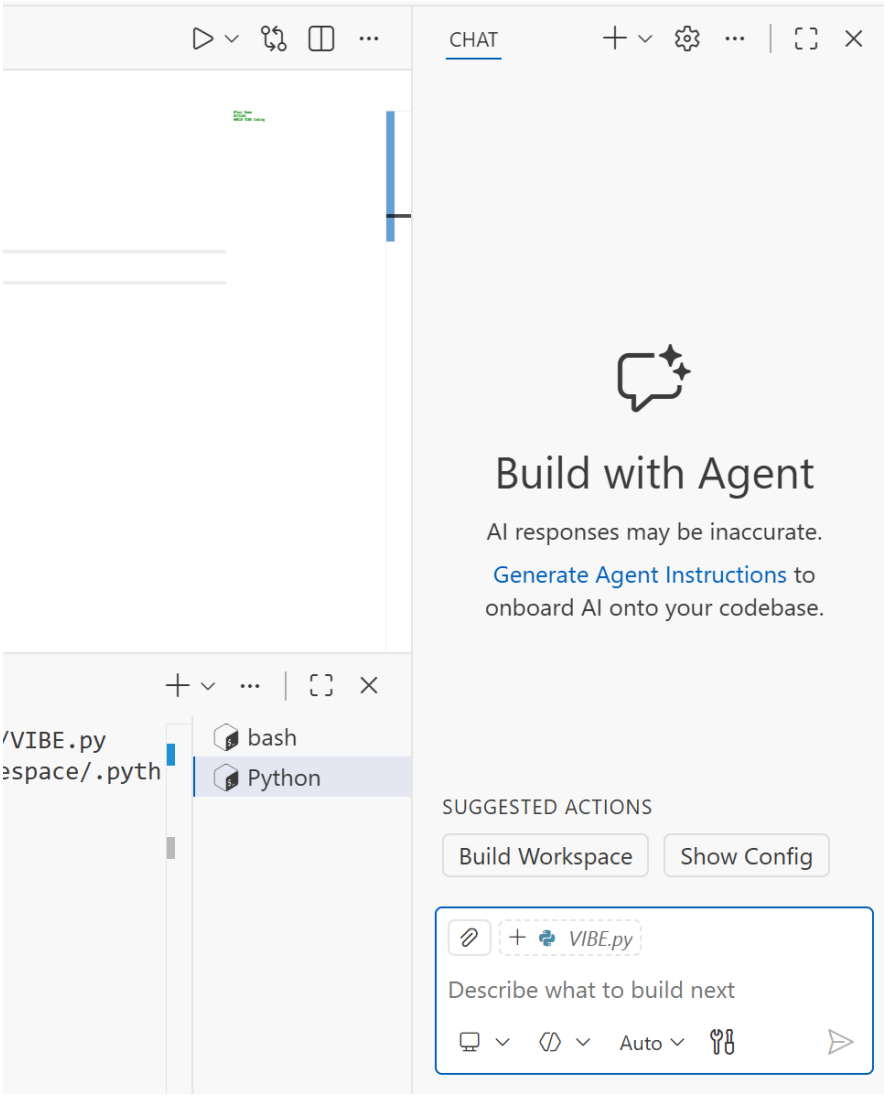
Step 1

In our environment let's add our standard header.
#Your Name
#CIS261
#WK10 VIBE Coding

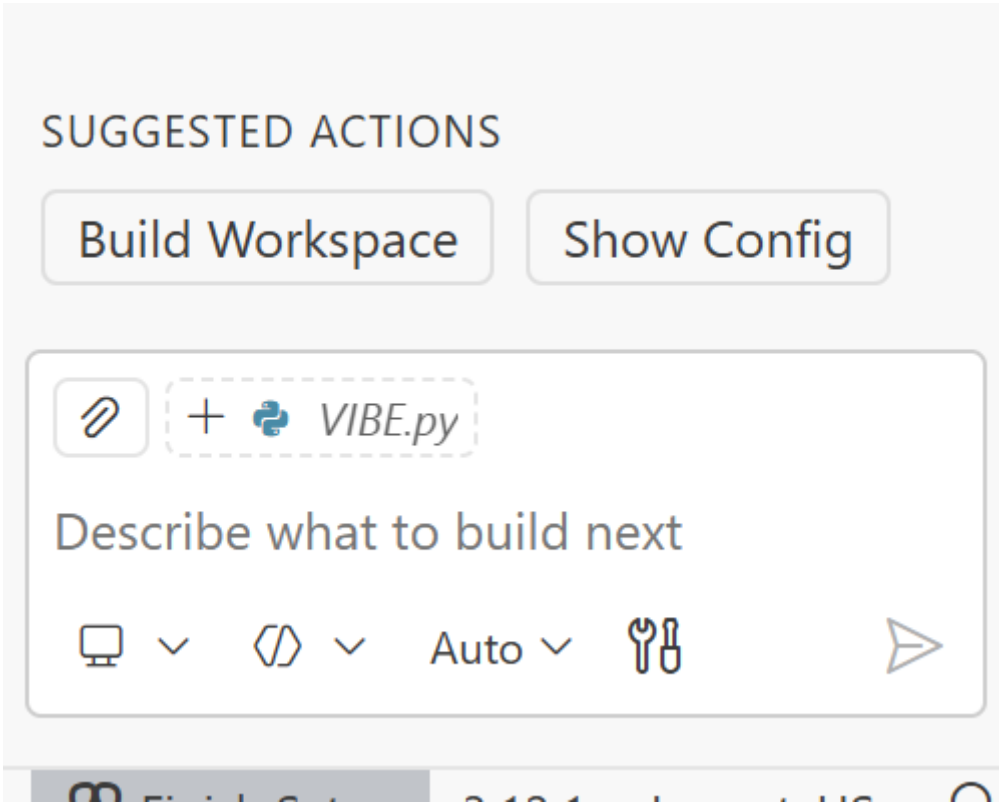


What is VIBE Coding? *""Vibe coding" is a new and loosely-defined term in software development that refers to the practice of prompting AI tools to generate code rather than writing code manually." (IBM, 1).*

On the far right of your screen you will see a CHAT window that says ‘Build with Agent”, this is exactly what we are going to do. However, remember what you have learned and put it all to practice. AI responses may be inaccurate, and it is our job to ensure that we present correct code.



We will type our prompt in the box at the bottom that says ‘Describe what to build next’



Step 2

Here is our prompt **(Be sure to read through it as you go, there are decisions you must make as a programmer)**:

I need help creating a Python program called Student Grade Calculator. Here are the requirements:

PROGRAM PURPOSE:
Create a program that manages student records including test scores and calculates grades.

DATA REQUIREMENTS:
- Student name (string)
- Student ID (string)
- Three test scores (floats): Test 1, Test 2, Test 3
- Calculated average score (float)
- Calculated letter grade (string based on: A=90-100, B=80-89, C=70-79, D=60-69, F=below 60)

PROGRAM FEATURES:

1. Add new student records (prompt for name, ID, and three test scores)
2. Calculate average automatically from the three scores
3. Calculate letter grade automatically based on average
4. Display all students with their information in a formatted table
5. Calculate and display class statistics (highest average, lowest average, class average)
6. Search for a student by name (case-insensitive)
7. Save all student records to a file called "student_grades.txt"
8. Load student records from the file when the program starts
9. Use ESC to exit the program

DATA STRUCTURE:

[Choose ONE and tell VIBE which you prefer]

- Option A: Use a list of dictionaries where each dictionary has keys: 'name', 'id', 'test1', 'test2', 'test3', 'average', 'grade'
- Option B: Use a Student class with attributes for name, id, test scores, average, and grade

FILE FORMAT:

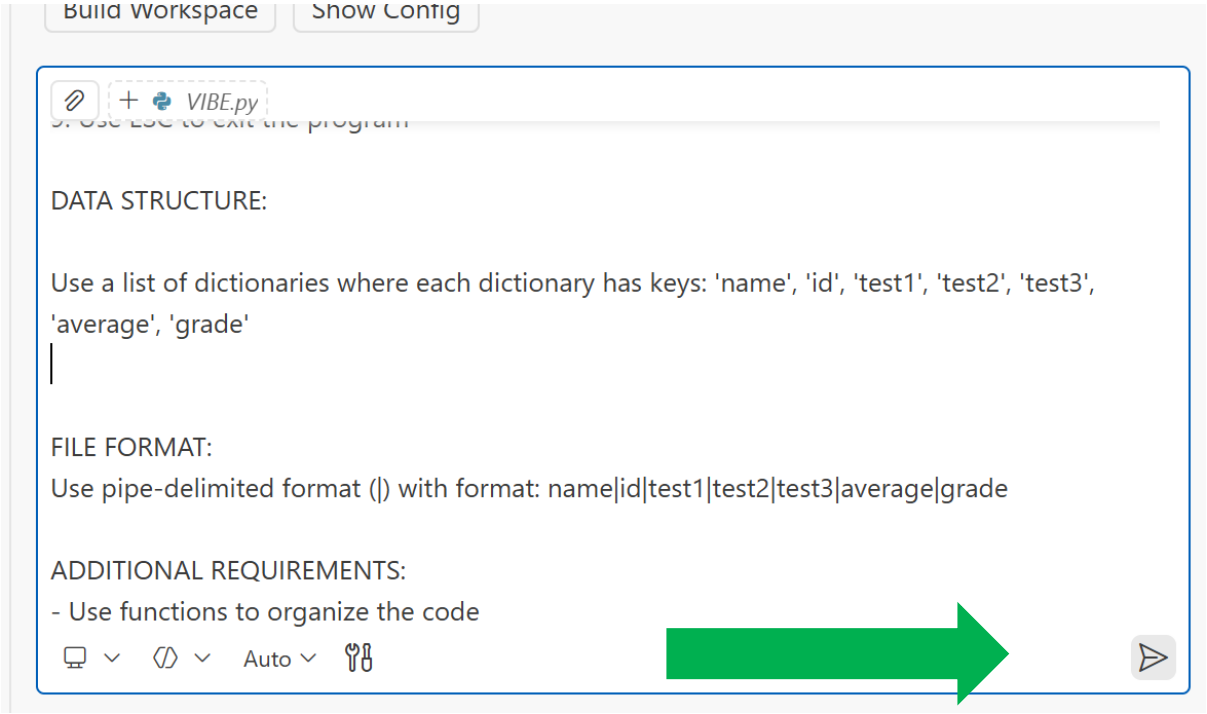
Use pipe-delimited format (|) with format:
name|id|test1|test2|test3|average|grade

ADDITIONAL REQUIREMENTS:

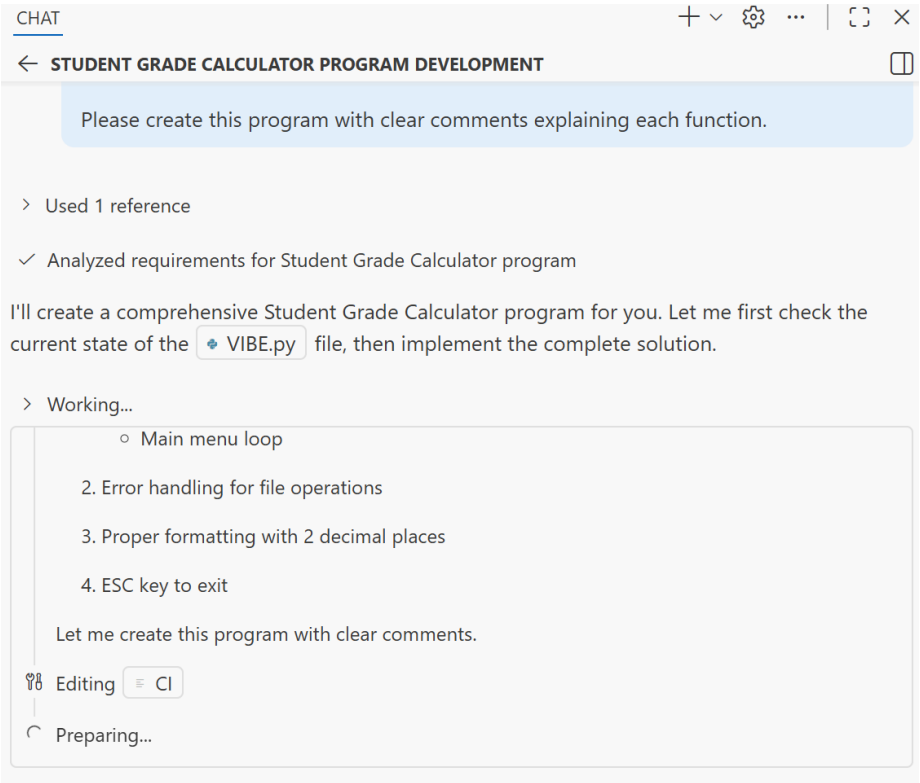
- Use functions to organize the code
- Include error handling for file operations
- Display clear messages for the user
- Format all scores to 2 decimal places
- Allow entering multiple students before exiting

Notice: When we are talking to computers we are to be as specific as possible. We are telling the AI Agent the purpose of the program, the data requirements, the program features, the data structure, the file format, and any other requirements we might need.

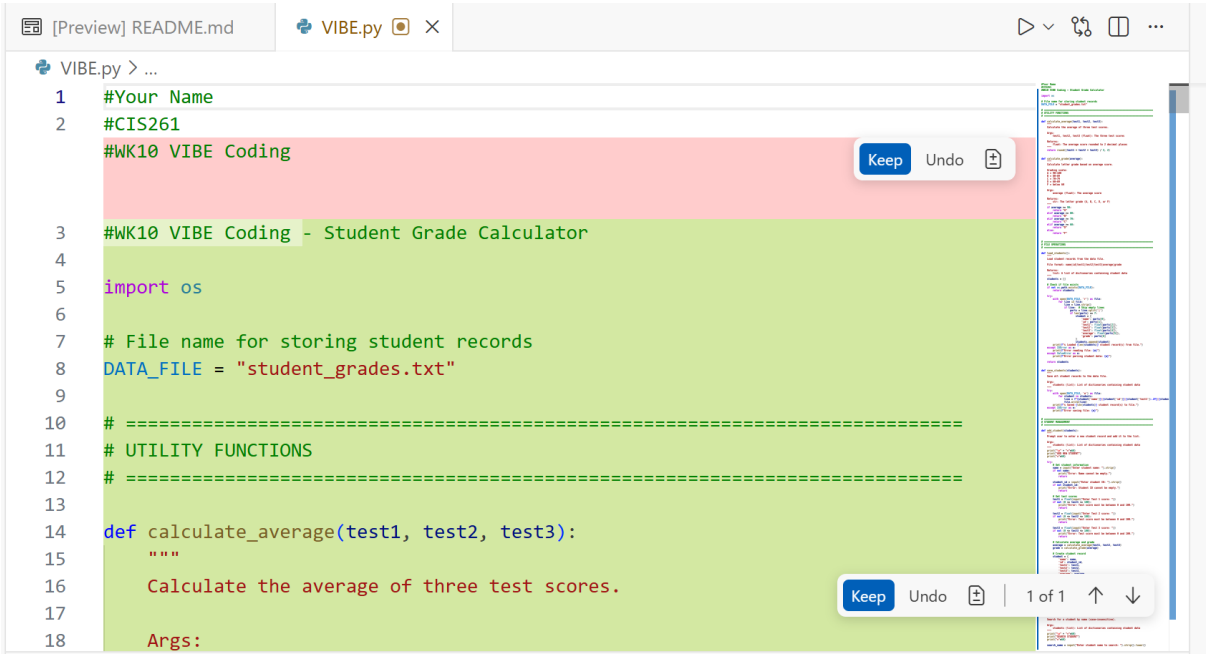
When done typing hit the arrow to send your prompt to the agent.



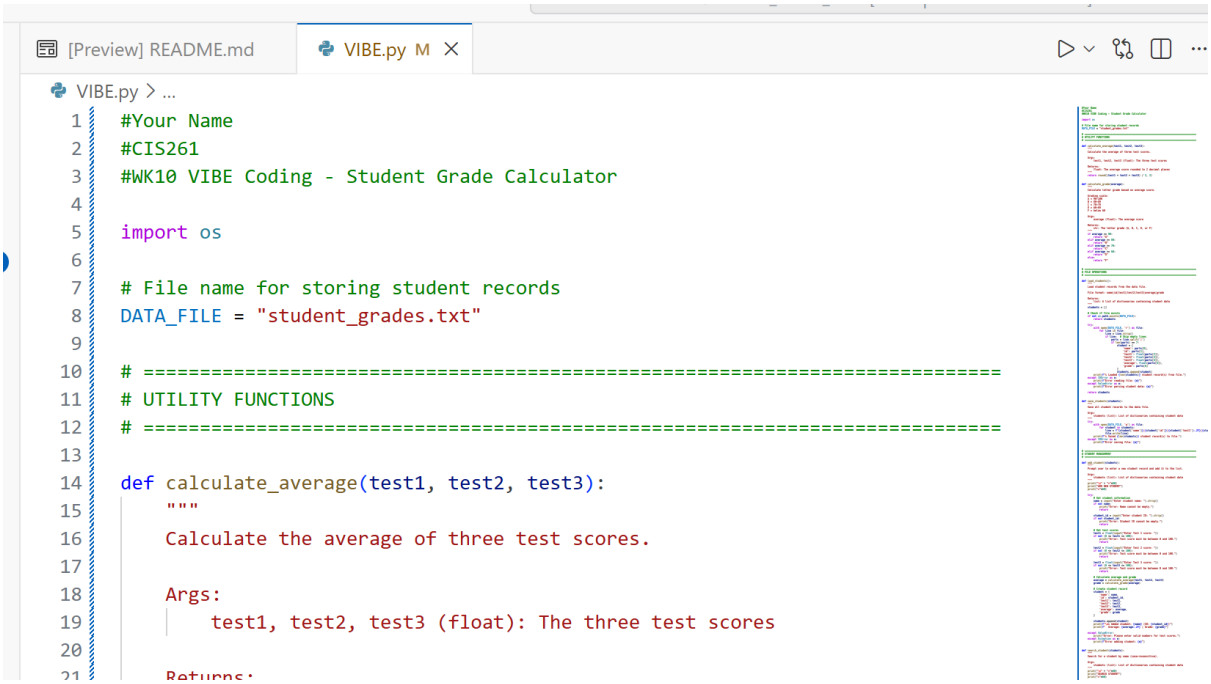
You will see your AI Agent go to work for you.



In your main window your code from your prompt will then appear. You will see prompting to keep or undo to verify if you need some lines. For example here for line 2, I can keep the changes or undo. If I undo all of the code from the agent will disappear.



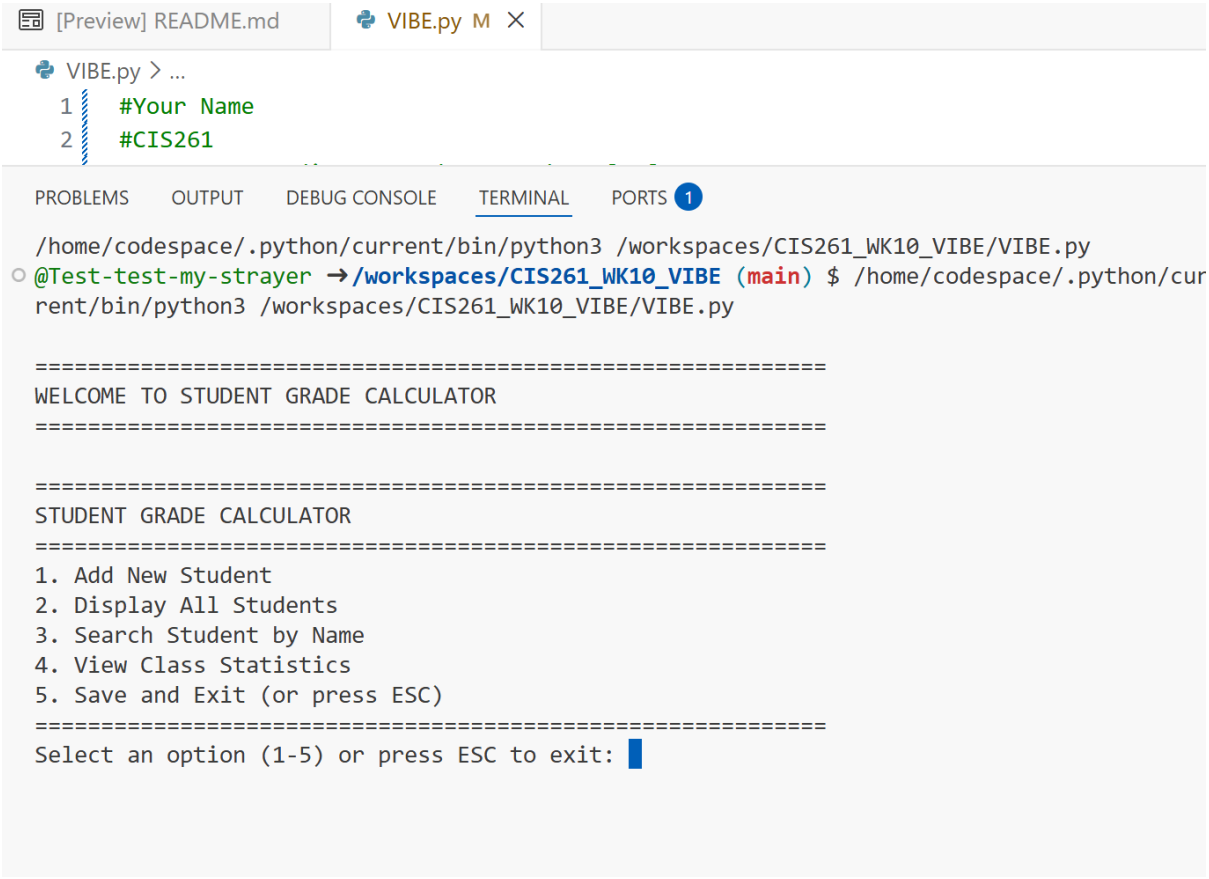
I selected Keep:



Step 3

Take the time to review your code. Take a look at what your AI Agent has typed and then let's run it to see how well it works.

Run the file: Here is the first output



Option 1 to Add a New Student:

Using this list create students:

Alice Johnson

Student ID: S1001

Test 1 – 95

Test 2 – 88

Test 3 – 92

```
============================================================
ADD NEW STUDENT
============================================================
Enter student name: Alice Johnson
Enter student ID: S1001
Enter Test 1 score: 95
Enter Test 2 score: 88
Enter Test 3 score: 92

✓ Added student: Alice Johnson (ID: S1001)
  Average: 91.67 | Grade: A
```

Bob Smith

Student ID: S1002

Test 1 – 78

Test 2 – 82

Test 3 – 75

```
============================================================
ADD NEW STUDENT
============================================================
Enter student name: Bob Smith
Enter student ID: S1002
Enter Test 1 score: 78
Enter Test 2 score: 82
Enter Test 3 score: 75

✓ Added student: Bob Smith (ID: S1002)
  Average: 78.33 | Grade: C
```

Jamie Smith

Student ID: S1003

Test 1 – 65

Test 2 – 98

Test 3 - 75

```
============================================================
ADD NEW STUDENT
============================================================
Enter student name: Jamie Smith
Enter student ID: S1003
Enter Test 1 score: 65
Enter Test 2 score: 98
Enter Test 3 score: 75

✓ Added student: Jamie Smith (ID: S1003)
  Average: 79.33 | Grade: C
```

Now, test option 2 Display All Students:

```
================================================================================================
===========
ALL STUDENT RECORDS
================================================================================================
===========
Name                 ID           Test 1     Test 2     Test 3     Average    Grade
------------------------------------------------------------------------------------------------
-----------
Alice Johnson        S1001        95.00      88.00      92.00      91.67      A
Bob Smith            S1002        78.00      82.00      75.00      78.33      C
Jamie Smith          S1003        65.00      98.00      75.00      79.33      C
================================================================================================
===========
Total students: 3
```

Option 3 to Search by Name (Try both a name that exists and one that does not):

```
============================================================
SEARCH STUDENT
============================================================
Enter student name to search: Bob Smith

Found student:
  Name: Bob Smith
  ID: S1002
  Test 1: 78.00
  Test 2: 82.00
  Test 3: 75.00
  Average: 78.33
  Grade: C
```

```
============================================================
SEARCH STUDENT
============================================================
Enter student name to search: Ashley Molina
No student found with name: ashley molina
```

Option 4 to View Class Statistics:

```
============================================================
CLASS STATISTICS
============================================================

Class Average: 83.11
Highest Average: 91.67 (Alice Johnson)
Lowest Average: 78.33 (Bob Smith)

Grade Distribution:
  C: 2 student(s)
  A: 1 student(s)
```

Option 5 to Save and Exit also try ESC to make sure the program saves and exits:

```
============================================================
STUDENT GRADE CALCULATOR
============================================================
1. Add New Student
2. Display All Students
3. Search Student by Name
4. View Class Statistics
5. Save and Exit (or press ESC)
============================================================
Select an option (1-5) or press ESC to exit: 5

Saving records...
✓ Saved 3 student record(s) to file.
Thank you for using Student Grade Calculator!
```

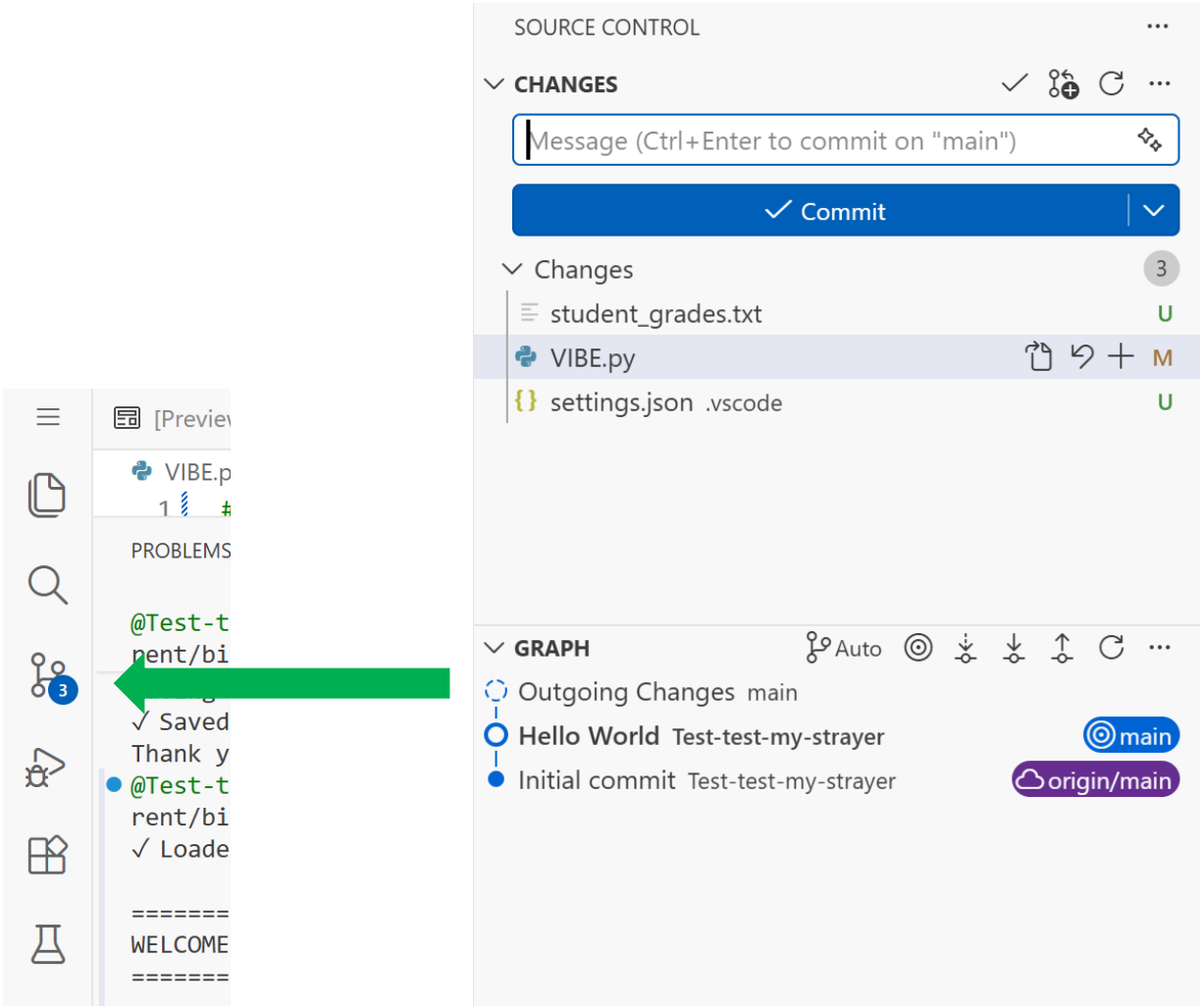
Using the ESC key on my keyboard:

```
============================================================
Select an option (1-5) or press ESC to exit: ^[

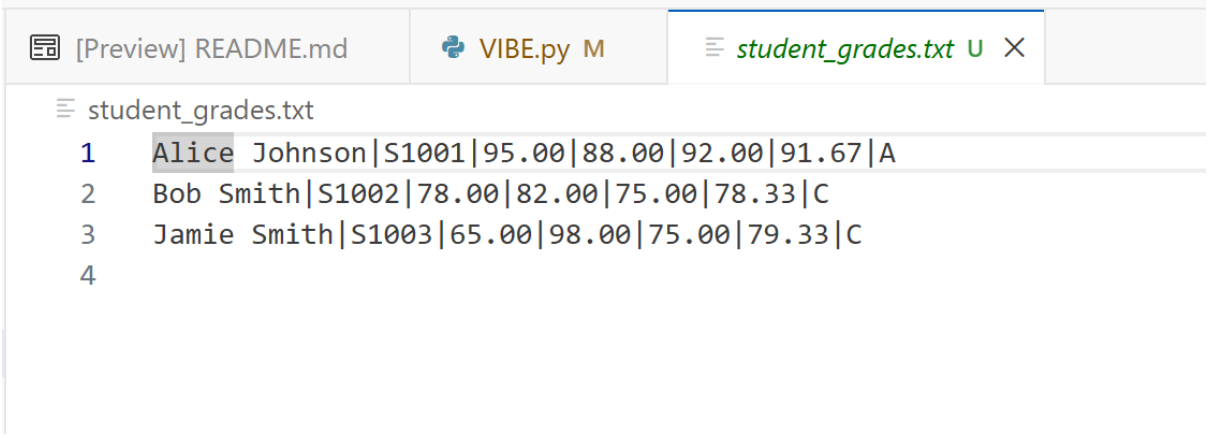
Saving records...
✓ Saved 3 student record(s) to file.
Thank you for using Student Grade Calculator!
```

Step 4

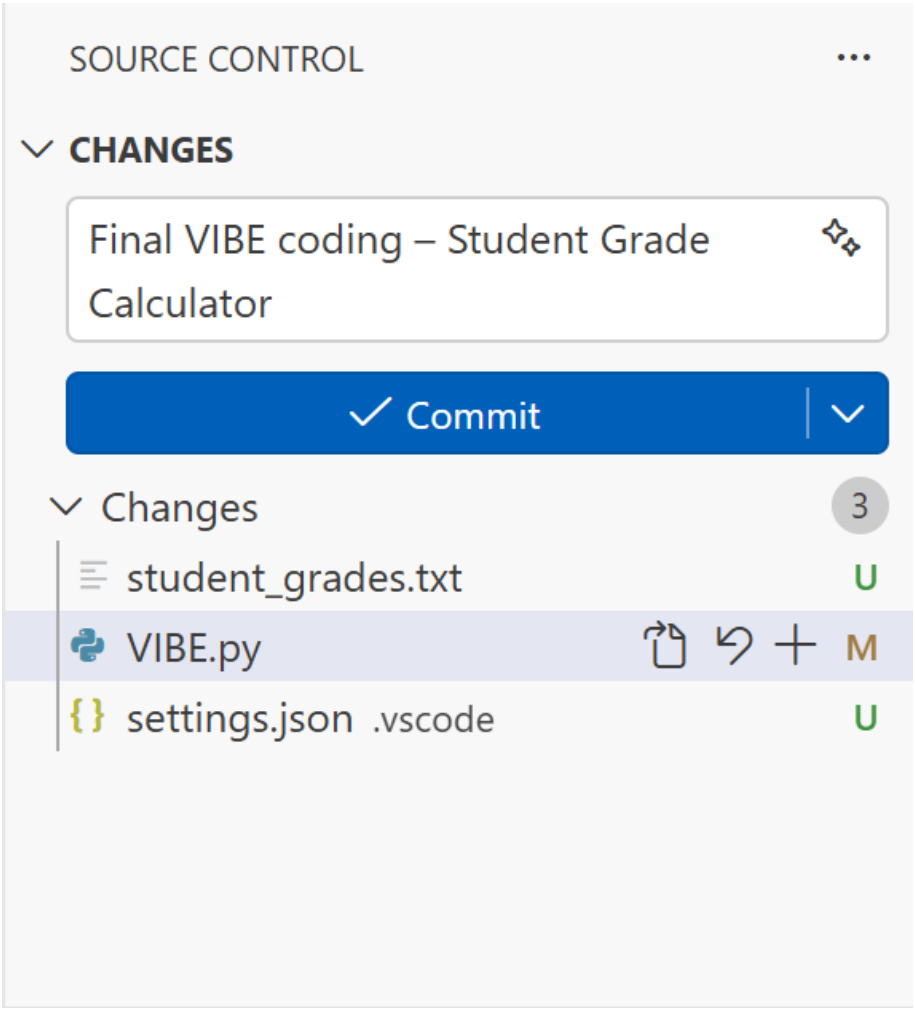
Now, it is time to ensure our changes are committed to the repository. Go to Source Control from the right menu.



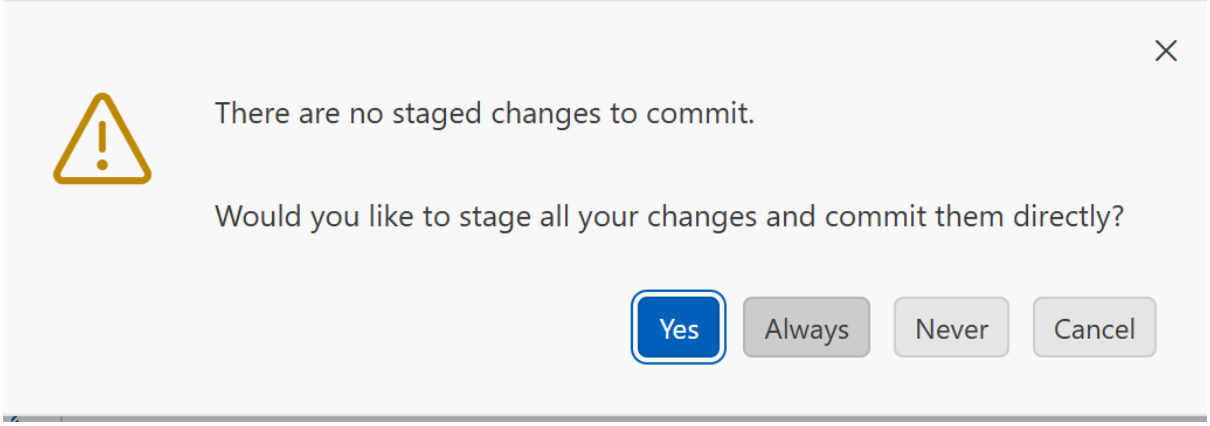
Notice that we have a new file **student_grades.txt,** this is our student file created from running our program. You can take a look at the file by clicking it and then it will open in a new tab at the top.



Let's finish committing our changes! We must always put in a message. For this one type: **Final VIBE coding – Student Grade Calculator**

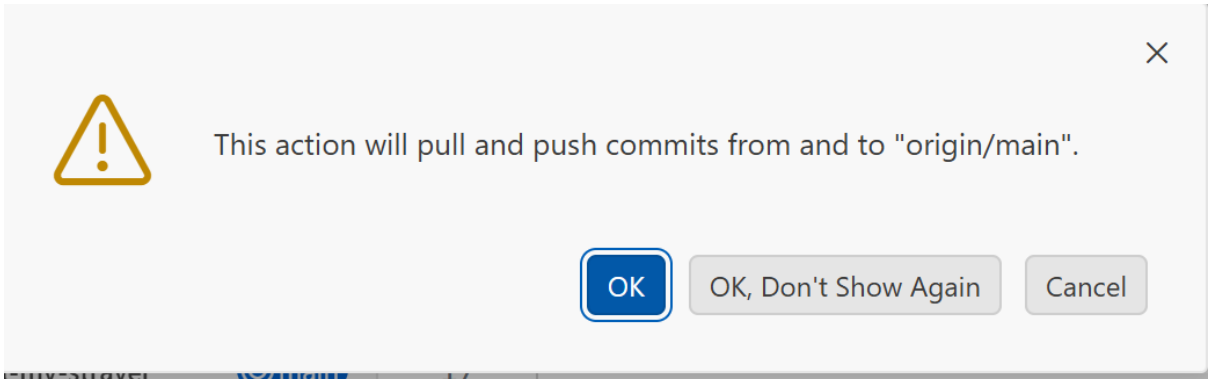


Then click Commit and Always!

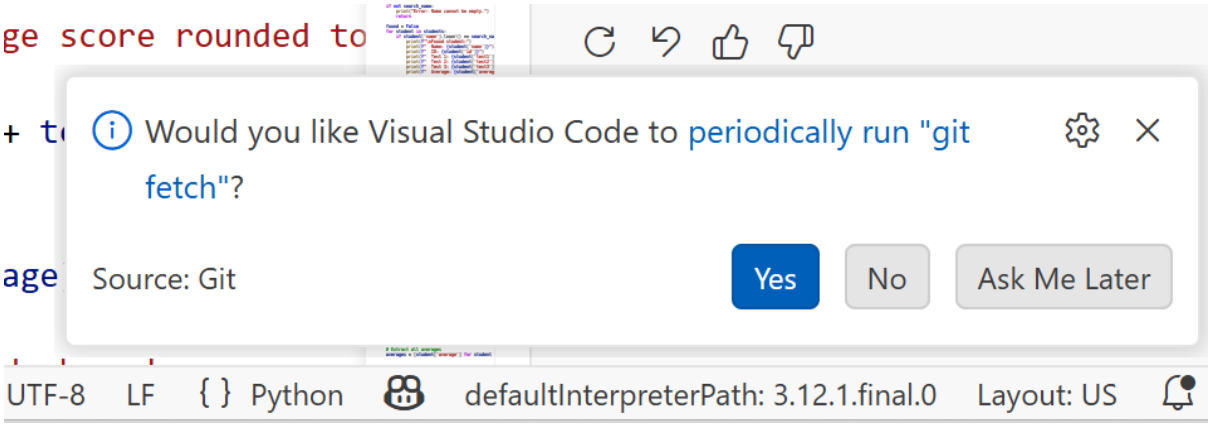


Now, we must push our commits or changes to our GitHub repository. Notice how we have Sync Changes 2? Click Sync Changes to push your changes to the repository.

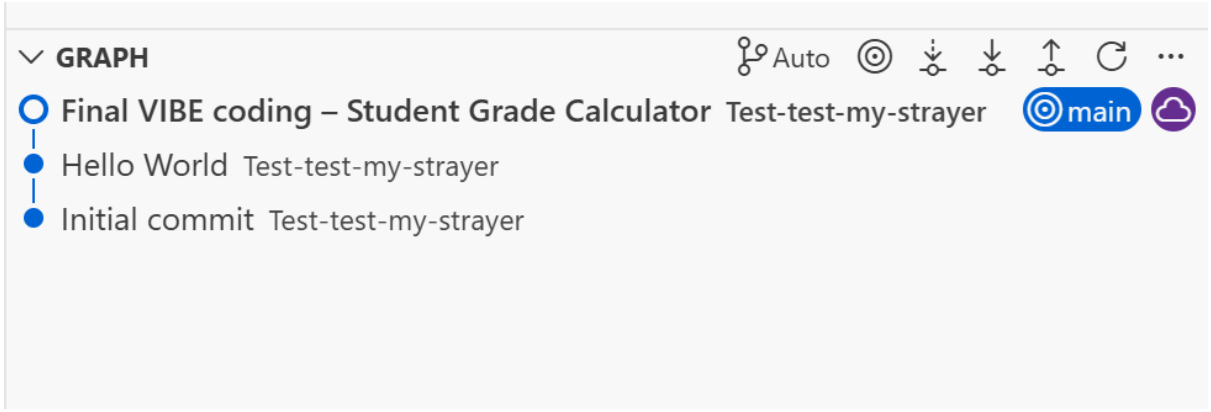
You will get a pop-up “This action will pull and push commits from and to “origin/main”. Select OK



You may see another pop-up that asks “Would you like Visual Studio Code to periodically run “git fetch’? You can select Yes here as well.



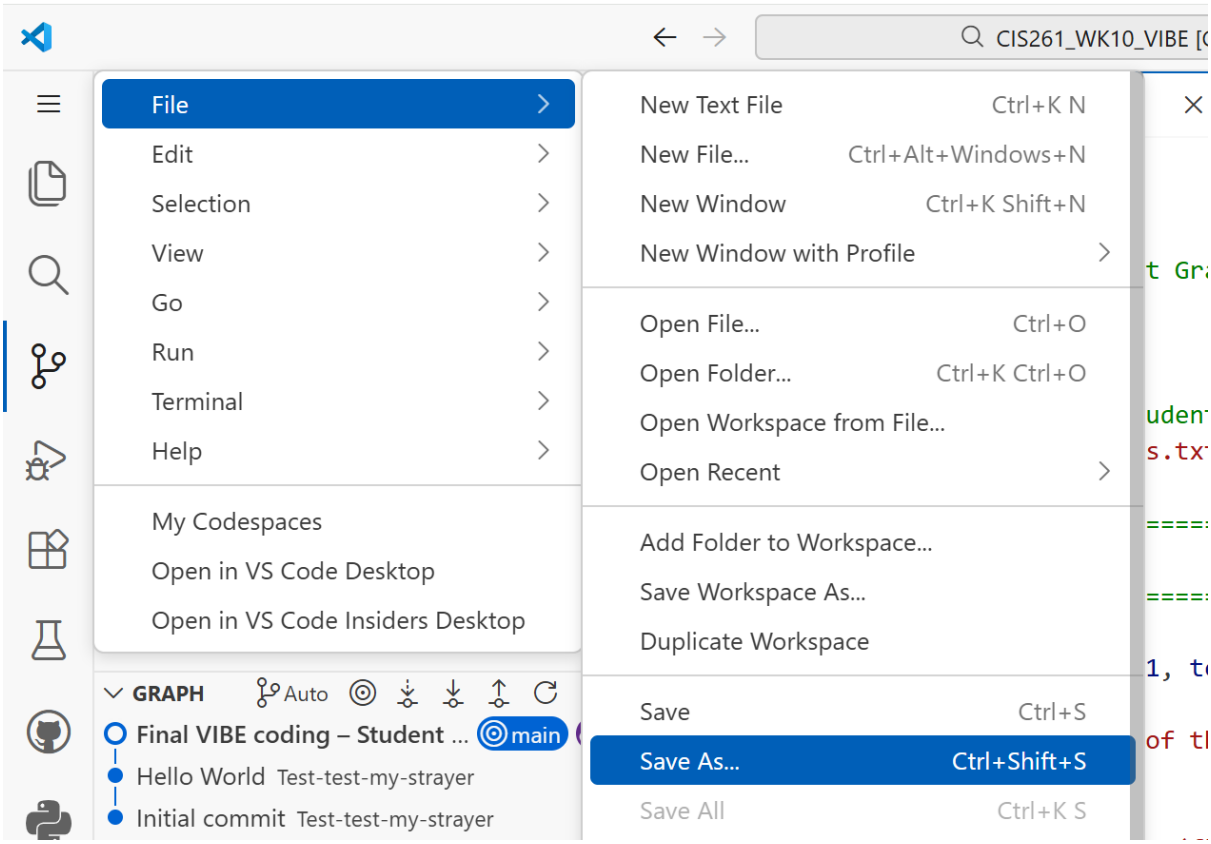
Here are your comments from where you saved your project.



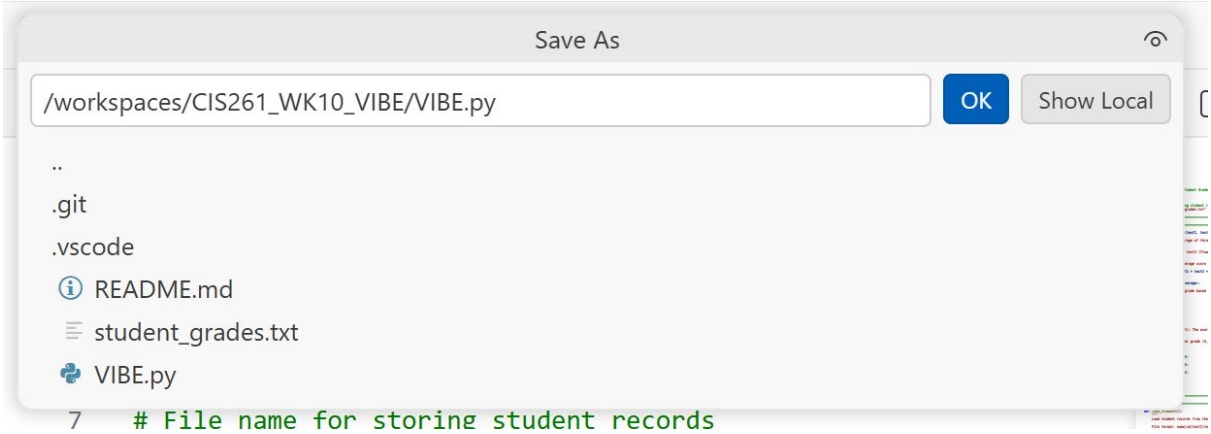
Congratulations!
You have completed your first VIBE Coding Assignment using GitHub Codespaces!

Step 5

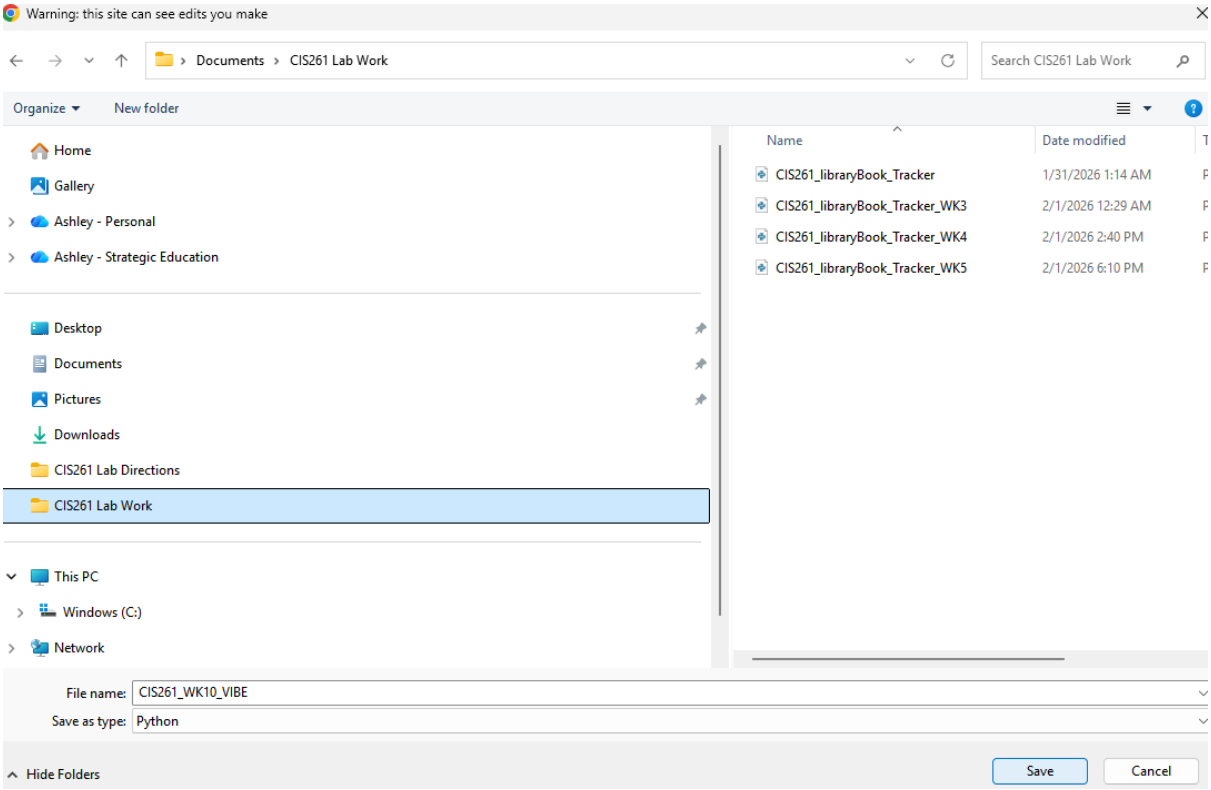
Now, we are going to download our python file for submission! To download your python file, we will click on the 3 dashes in the top left corner and go to File → Save As →



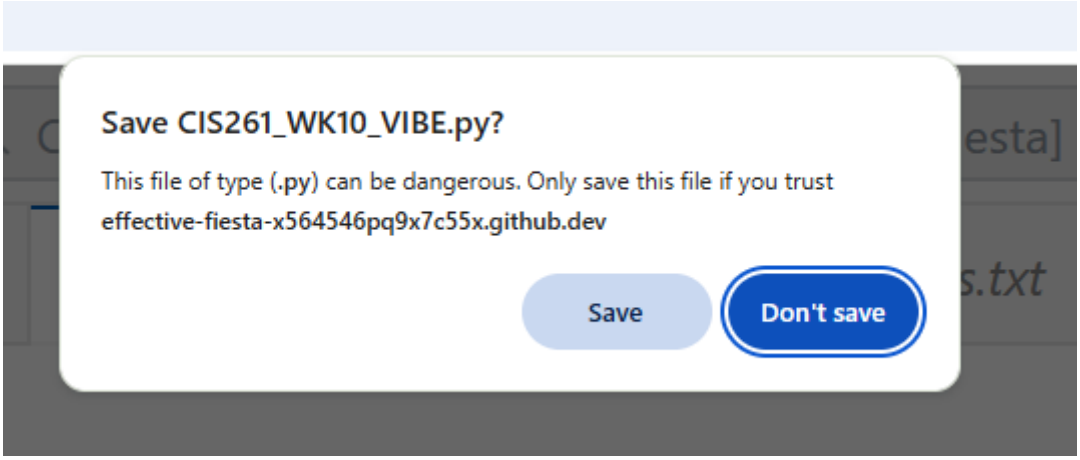
Click Show Local



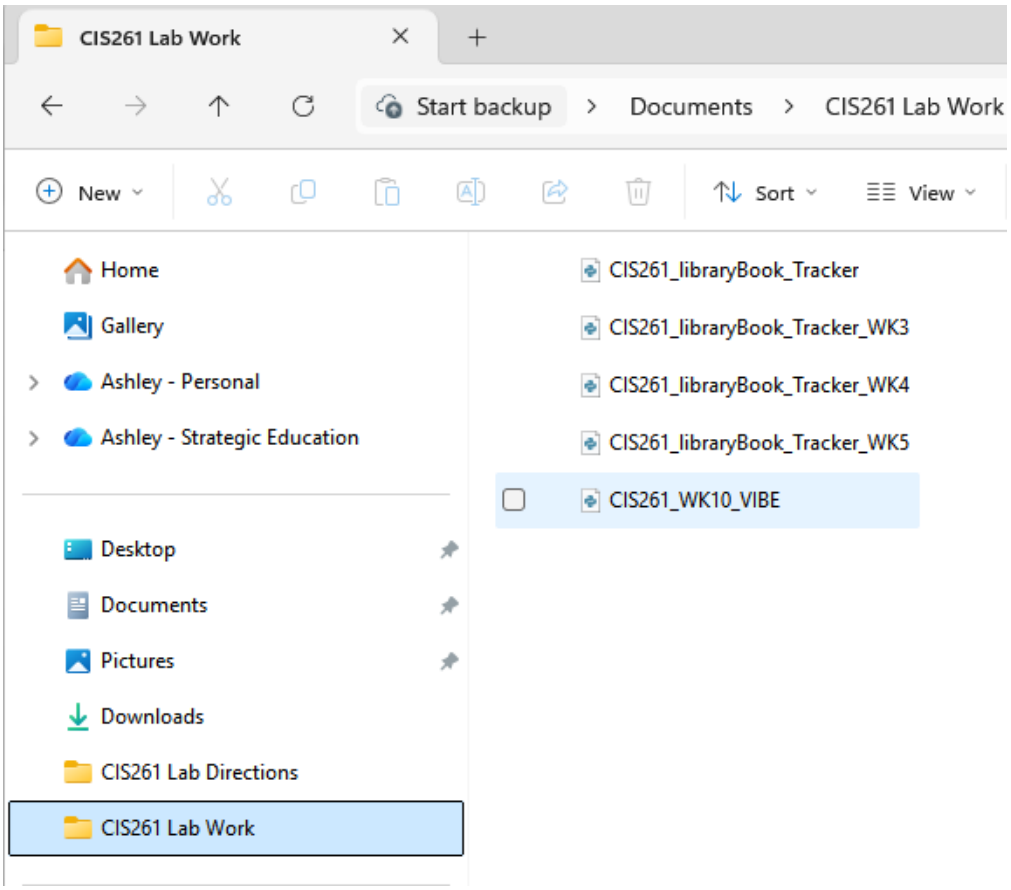
When your File Explorer pops up be sure your file name is **CIS261_WK10_VIBE** and select where you would like to save it on your computer to submit to Canvas.



When you click save you may get a pop-up that asks if you Trust this file, select Save.



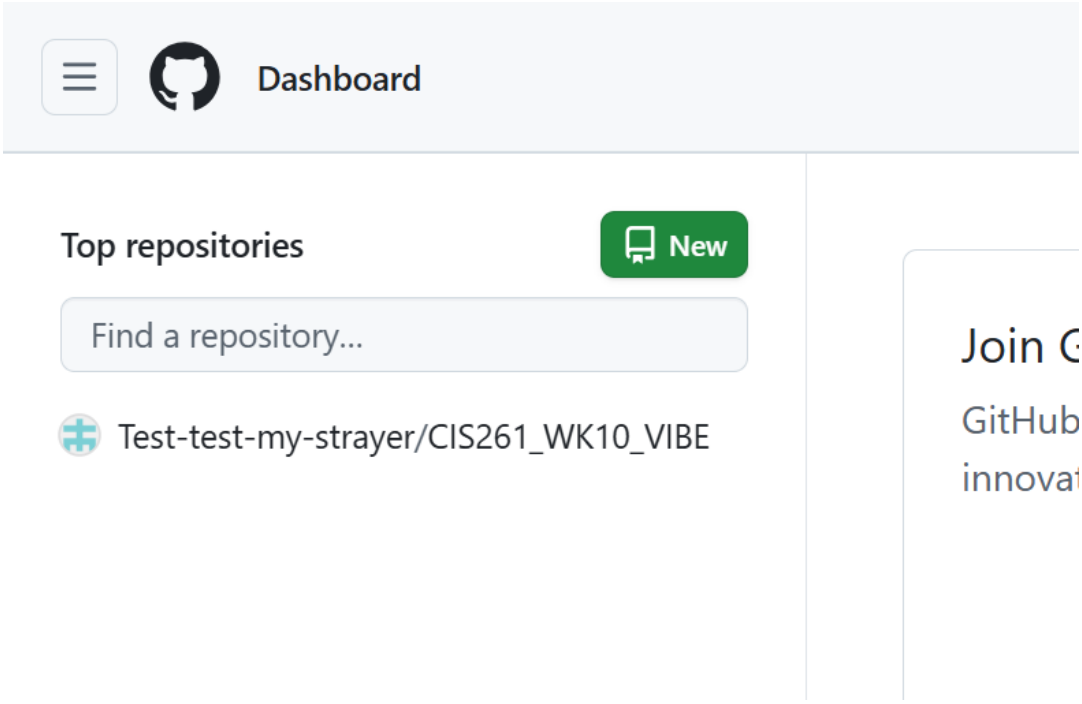
Your file is now saved to your computer and ready to be submitted to the Week 10 Lab area in Canvas.



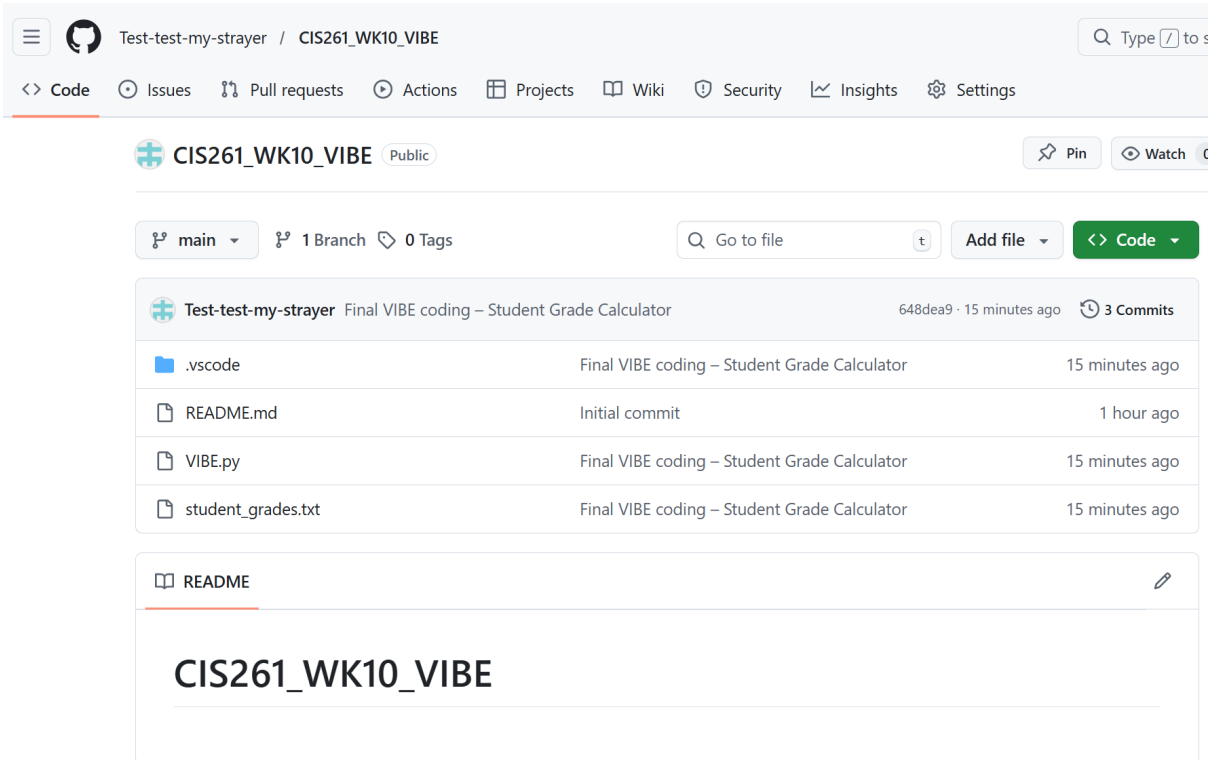
Step 6

Let's now go get your GitHub Repository! Navigate back to https://github.com/. You may still be logged in, if not go ahead and log in.

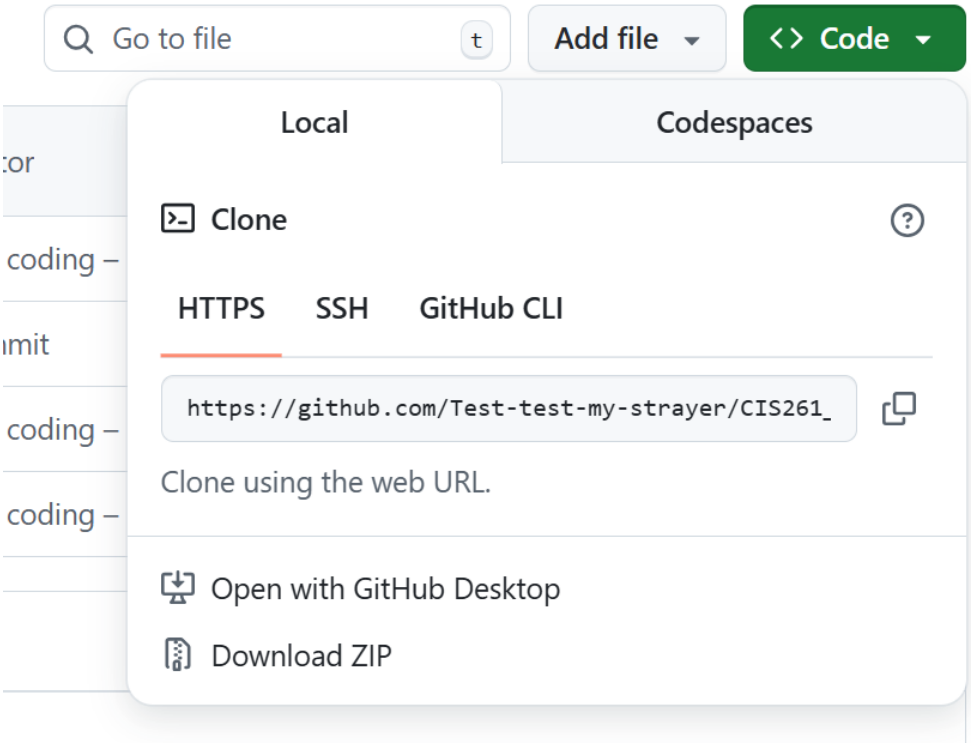
Your CIS261_WK10_VIBE repository should be there on the left side under Top repositories.



Click on the repository to open it.



We want to make sure we also have our GitHub repository link to share with our submission. To get your share link from this page click on the < > Code button and select Local, you will then see an HTTPS code you can select the copy option to copy it to your clipboard on the right of the link.

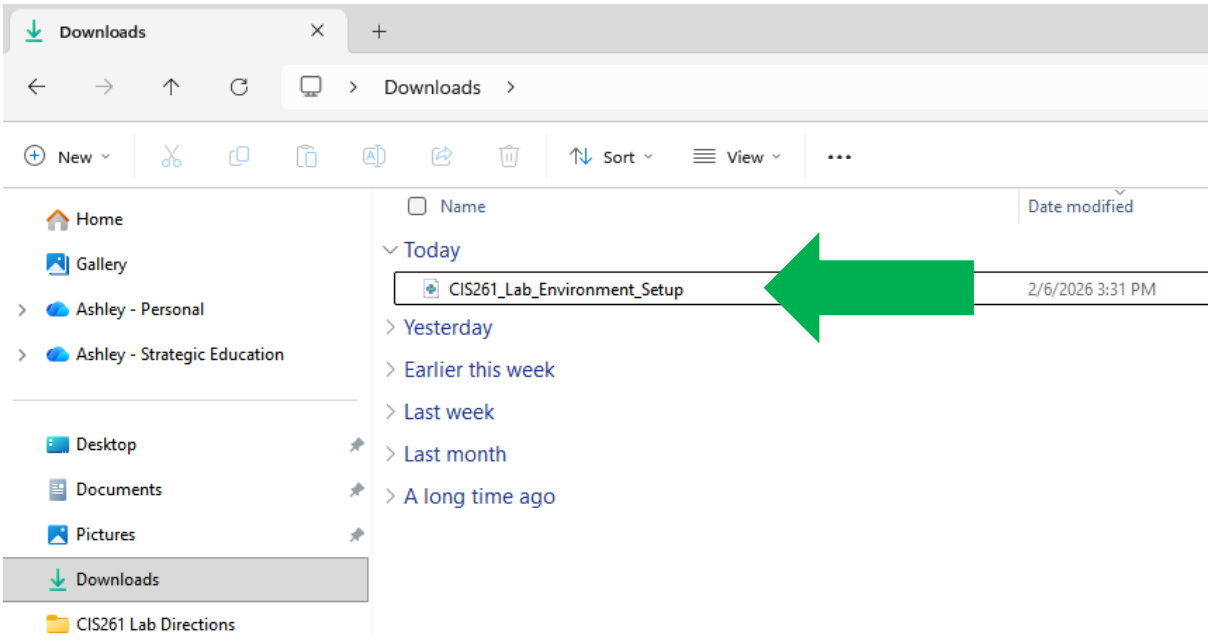


Keep this page open as you may need to revisit it during the submission process if you lose your copy you created.

Creating Your Lab Submission

Step 1

We have already downloaded our Python file to our File Explorer under our Downloads folder



Step 2

Go to https://canvas.strayer.edu/ in your web browser, sign-in, and select CIS261 Object-Oriented Computer Programming from your tiles.



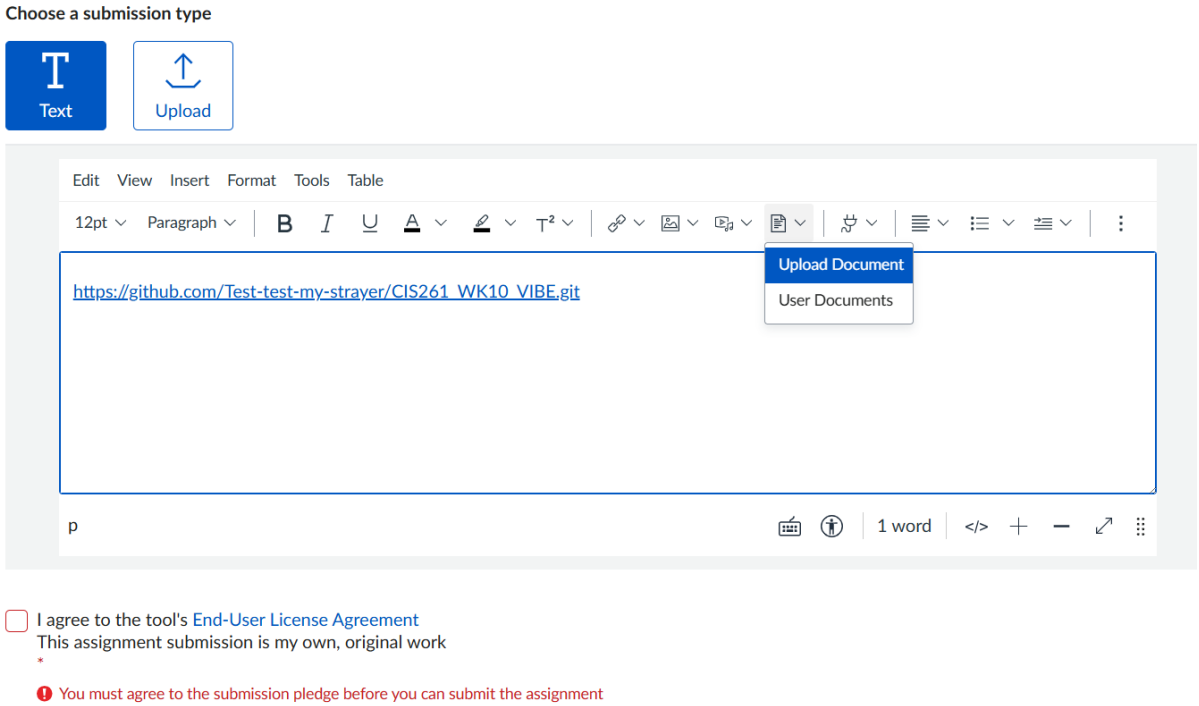
Step 2
Select Week 10 – Lab Submission from the Week 10 menu options.
For this lab you should submit your **CIS261_WK10_VIBE.py** and the link to your GitHub Repository.
directly to the **Week 10 – Lab Submission**.

Step 3

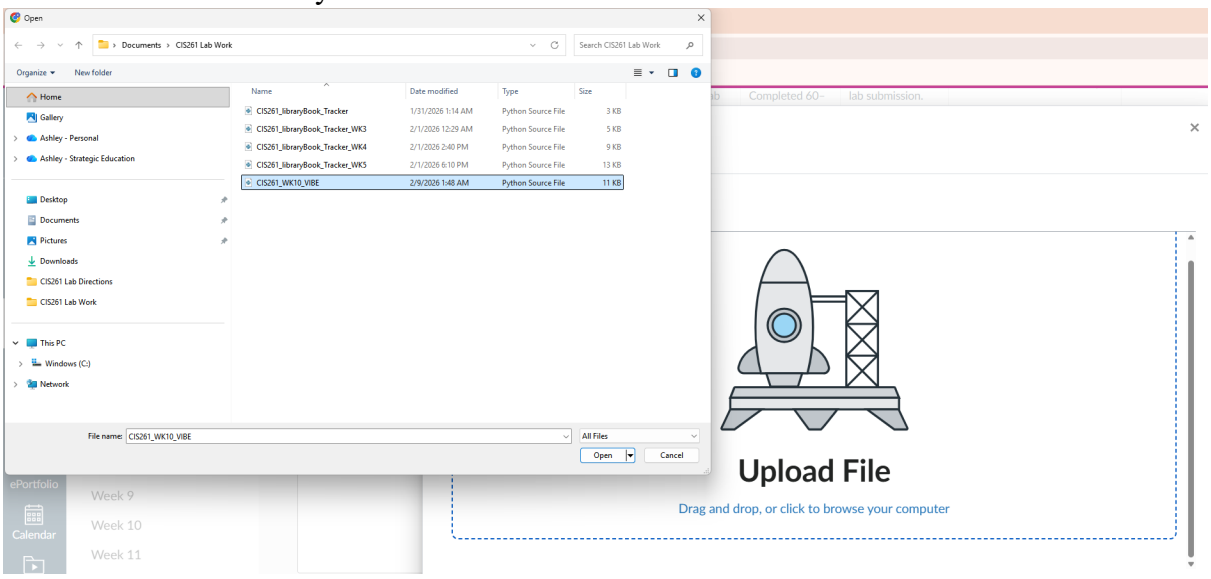
Select the **Text** option and a text box will open. In the text box you will copy the link to your GitHub repository (make sure to hit the space bar or enter after you paste the link to create an active hyperlink.

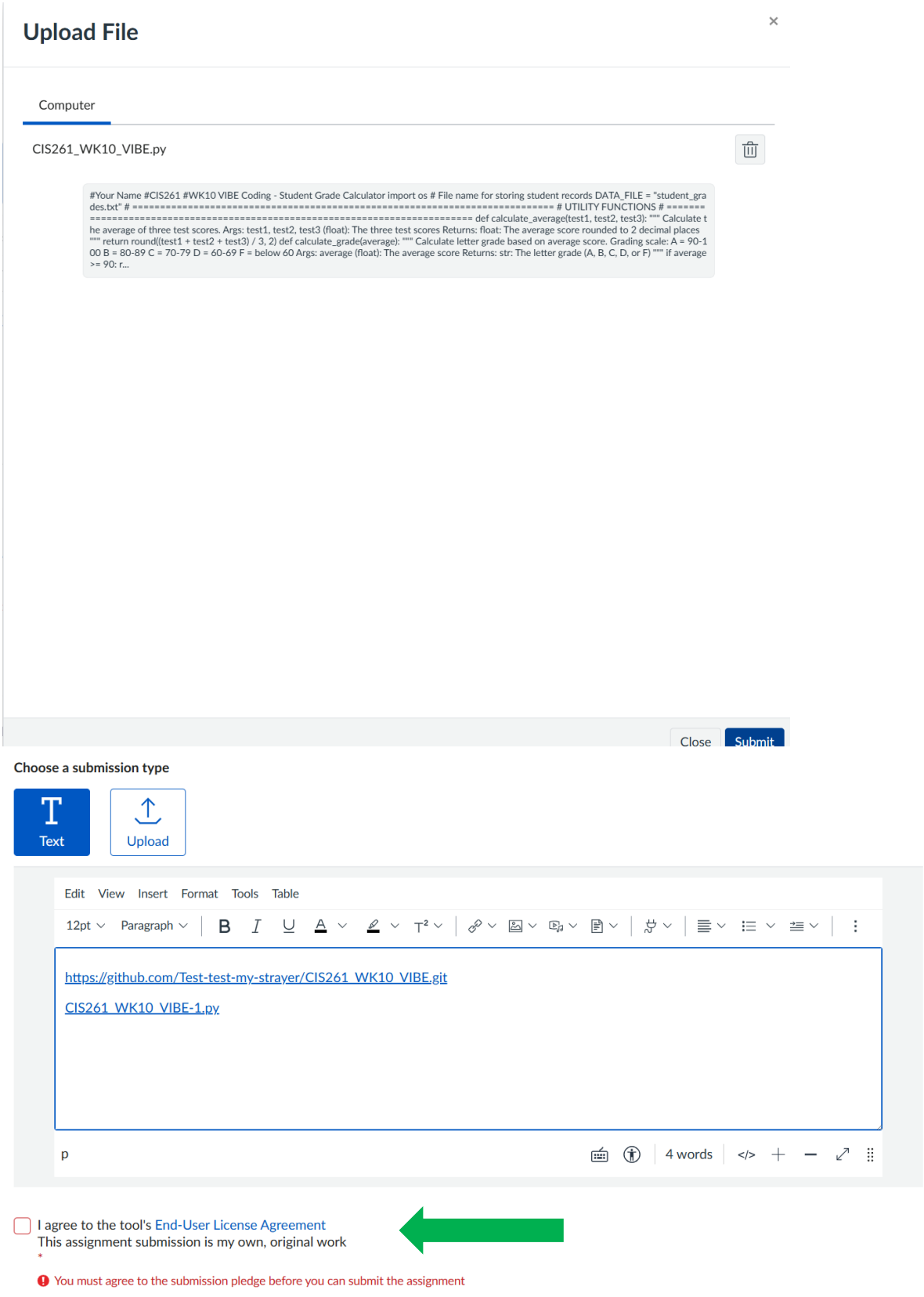
Now, we will add our Python file we downloaded by using the Upload Document option in our Canvas textbox menu.

We



When you click Upload Document your File Explorer on your computer will open, here you will select your **CIS261_WK10_VIBE.py** file. Click open to add the file to Canvas and then Submit to add it to your submission textbox.





When you have your link and your file in the textbox click "***I agree to the tool's End-User License Agreement. This assignment submission is my own, original work"*** and click "**Submit Assignment"** .

https://github.com/Test-test-my-strayer/CIS261_WK10_VIBE.git

CIS261_WK10_VIBE-1.py

You have now submitted your first VIBE coding Assignment in CIS261 using Codespaces!

END OF DOCUMENT