EECS 367 Lab
Git-ing started with Git

Administrative

- Welcome to AutoRob!
- Lots of information on the course website
  - https://autorob.org
- Assignment #1: Path Planning
  - Due 11:59pm, Friday, April 21

Lab Takeaways

- Git initialization
- Accessing GitHub Classroom
- Cloning KinEval stencil
- Make a change, commit, and push
- Validate your changes
- Project 1 walkthrough

What is Git?

Git is **version control** software, meaning that it tracks changes to your files (code, papers, …) as you work on them over time

Similar to “track changes” feature in document writing programs, except you must choose which versions to include in the tracking—it is not automatic

Widely used in academia and industry

The only way for you to submit your homework for this course!

Git Process Overview

Git Process Overview

your local machine

the directory where you're working

~/uname/reponame *or*
C:\Users\uname\reponame

"staging area"

the repository on your local computer

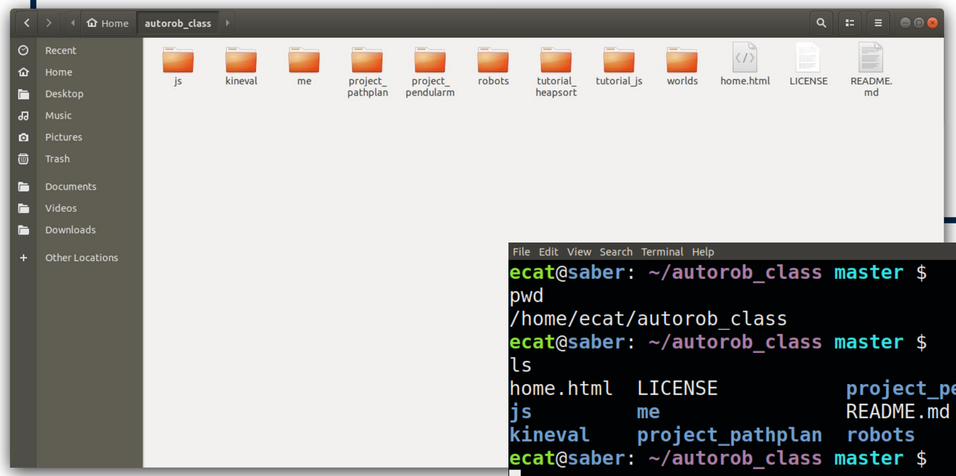
~/uname/reponame/.git

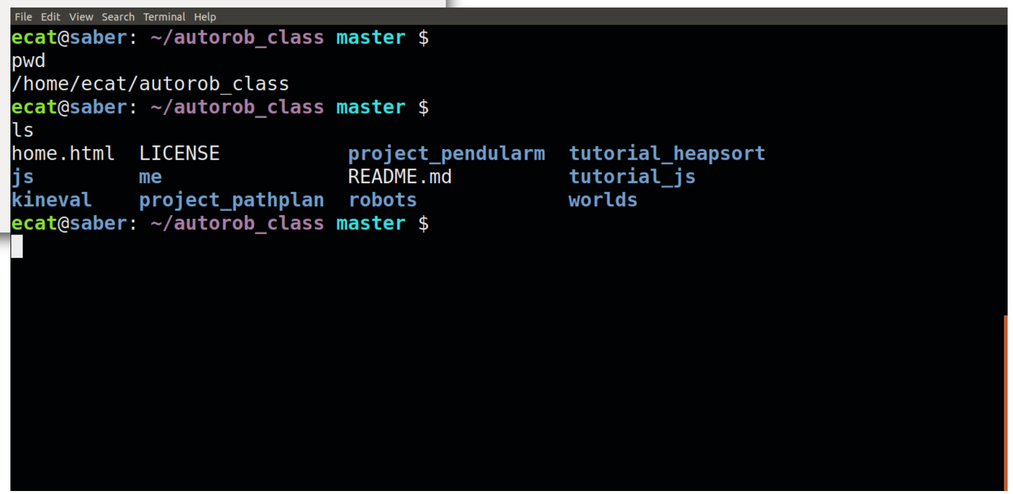
local repository

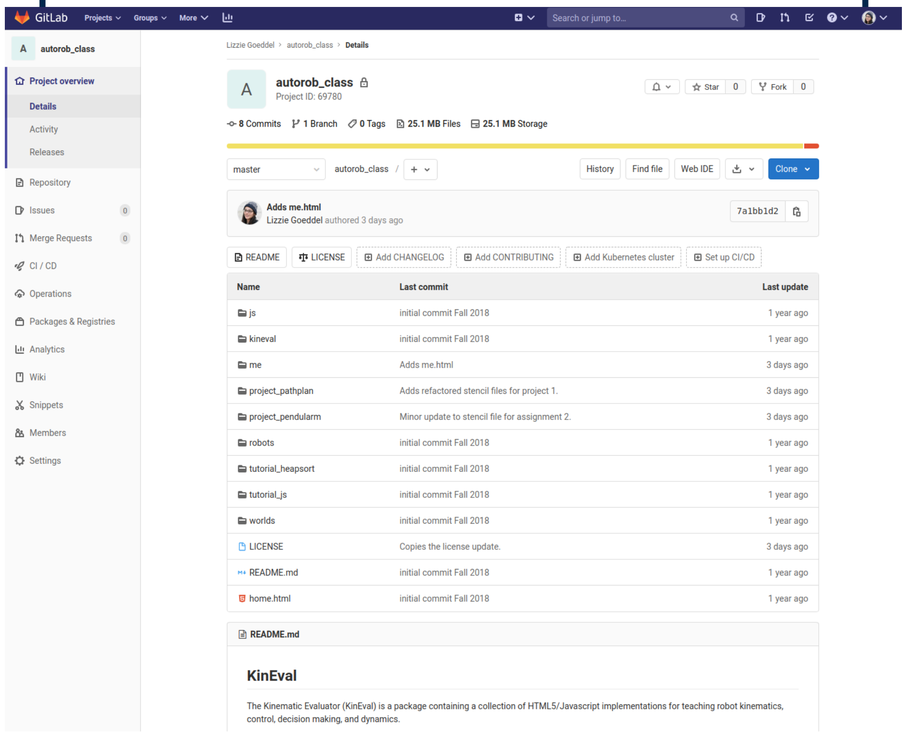
the cloud

(possibly multiple) repositories on a remote server

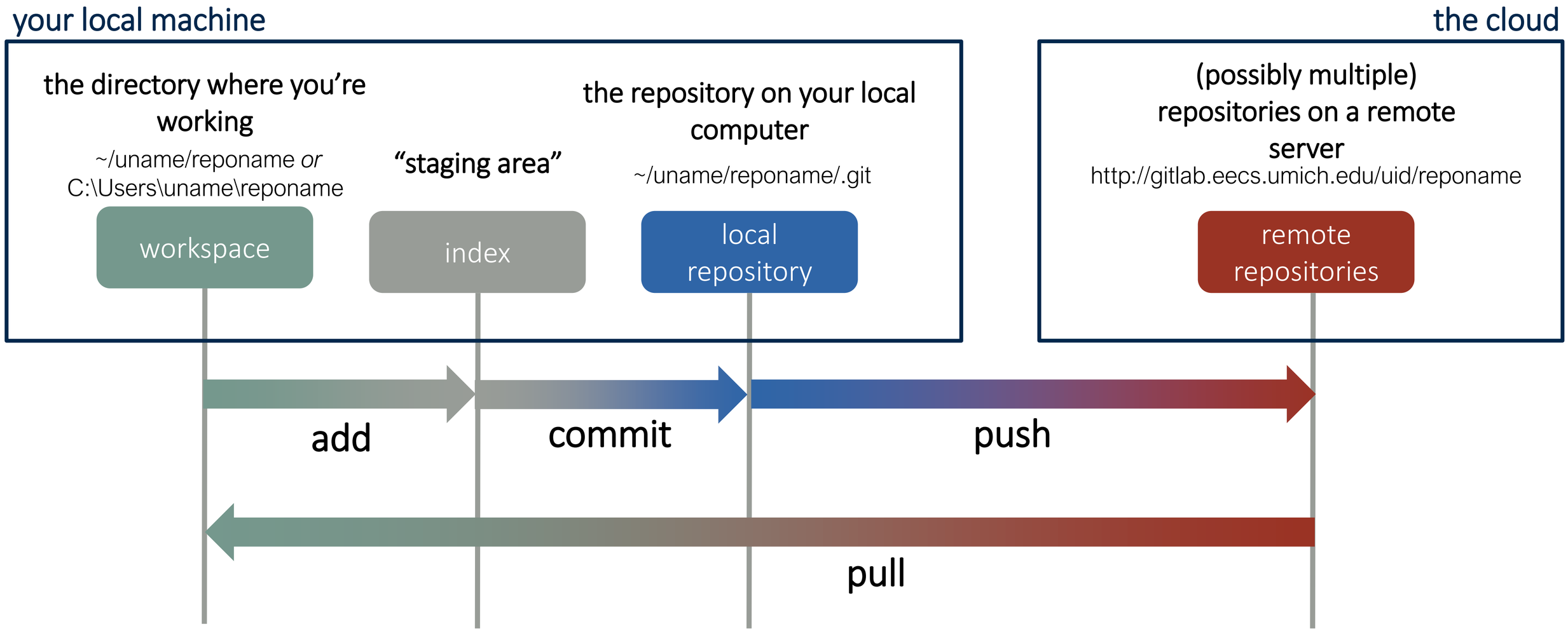
http://gitlab.eecs.umich.edu/uid/reponame







Git Process Overview



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Accessing GitHub Classroom

https://autorob.org/#assignment1

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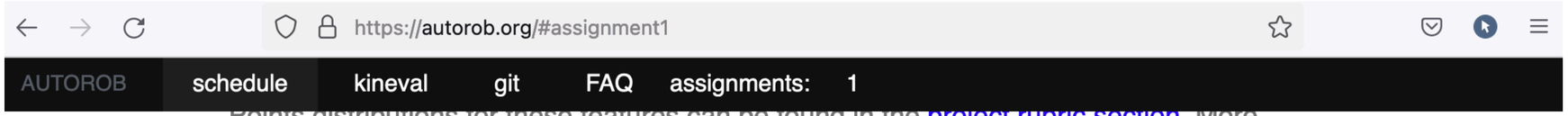
Assignment 1: Path Planning

Due 11:59pm, Friday, January 21, 2022

The objective of the first assignment is to implement a collision-free path planner in JavaScript/HTML5. Path planning is used to allow robots to autonomously navigate in environments from previously constructed maps. A path planner essentially finds a set of waypoints (or setpoints) for the robot to traverse and reach its goal location without collision. As covered in other courses (EECS 467, ROB 550, or EECS 568), such maps can be estimated through methods for simultaneous localization and mapping. Below is an example from EECS 467 where a robot performs autonomous navigation while simultaneously building an occupancy grid map:

Accessing GitHub Classroom



Points distributions for these features can be found in the project rubric section. More details about each of these features and the implementation process are given below.

Cloning the Stencil Repository

The first step for completing this project is to join our autorob-WN22 GitHub Classroom. By following the preceeding link, your GitHub account will be linked to our 'classroom' and a private clone of the KinEval stencil repository will be created for you to use. Your private repository will automatically be named `kineval-stencil-<username>` .

After joining the autorob-WN22 classroom, you will be able to clone your private repository for development on your local machine. The appended git quick start below is provided those unfamiliar with git to perform this clone operation, as well as commiting and pushing updates for project submission. **IMPORTANT**: the stencil repository should be cloned and **not forked**.

Throughout the KinEval code stencil, there are markers with the string "STENCIL" for code that needs to be completed for course projects. For this assignment, you will write code where indicated by the "STENCIL" marker in "tutorial_heapsort/heap.js" and "project_pathplan/graph_search.js".

Heap Sort Tutorial

The recommended starting point for this assignment is to complete the heap sort implementation in the "tutorial_heapsort" subdirectory of the stencil repository. In this directory, a code stencil in JavaScript/HTML5 is provided in two files: "heapsort.html" and

Follow link to accept invite

https://classroom.github.com/a/j_-yiHwt

https://classroom.github.com/assignment-invitations/161971f59bad0fd97e7cbaabefaa6254

GitHub Classroom

GitHub Education

Join the classroom:

autorob-WN22

To join the GitHub Classroom for this course, please select yourself from the list below to associate your GitHub account with your school's identifier (i.e., your name, ID, or email).

Can't find your name? Skip to the next step →

Identifiers

Test Student ›

https://classroom.github.com/assignment-invitations/161971f59bad0fd97e7cbaabefaa6254/status

GitHub Classroom

GitHub Education

You're ready to go!

You accepted the assignment, **Kinematic Evaluator**.

Your assignment repository has been created:

https://github.com/autorob-WN22/kineval-stencil-student

We've configured the repository associated with this assignment (update).

Join the GitHub Student Developer Pack

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autorob-WN22 / kineval-stencil- student Private

generated from autorob-WN22/kineval-stencil

Watch 1 Fork 0 Star 0

Code Issues Pull requests Actions Projects Security Insights

master 1 branch 0 tags Go to file Add file Code

github-classroom Initial commit bb26d54 17 hours ago 1 commit

js	Initial commit	17 hours ago
kineval	Initial commit	17 hours ago
project_pathplan	Initial commit	17 hours ago
project_pendularm	Initial commit	17 hours ago
robots	Initial commit	17 hours ago
tutorial_heapsort	Initial commit	17 hours ago
tutorial_js	Initial commit	17 hours ago
worlds	Initial commit	17 hours ago
LICENSE	Initial commit	17 hours ago
README.md	Initial commit	17 hours ago

About

kineval-stencil- student created by GitHub Classroom

Readme
View license
0 stars
1 watching
0 forks

Releases

No releases published
Create a new release

Packages

No packages published

https://forms.gle/uEfkN8aPWaYZ87K3A

Student Workflow Survey - AutoRob Winter 2022

This survey is being conducted for students of the AutoRob course (http://autorob.org) at Michigan (EECS 367, ROB 320) for the Winter 2022 semester. The purpose of this survey is to better understand student perspectives and their working environment as they begin the course. Such insights are especially useful given the constraints of the COVID-19 pandemic. The results of this survey will be used to assign students in the course to study pods, determine necessary accommodations for individual students, and adapt the administration of the course to best serve all students.

https://forms.gle/uEfkN8aPWaYZ87K3A

* Required

Last Name or Family Name *

Your answer

First Name *

Your answer

Unique Name (e.g. topipari, oci) *

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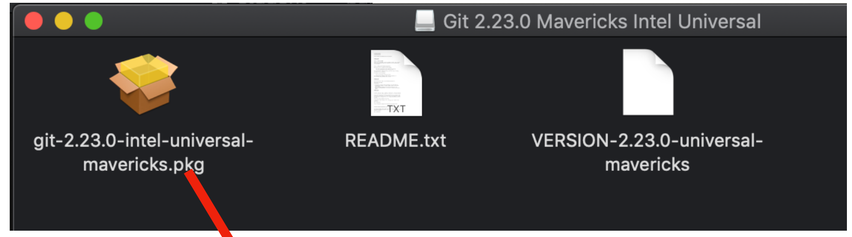
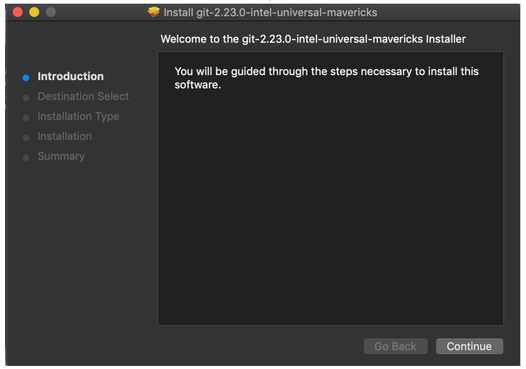
Cloning KinEval Stencil

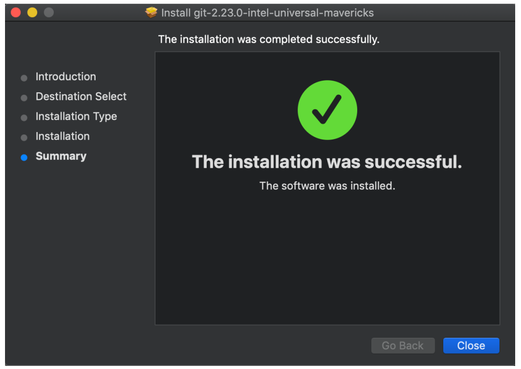
0) Install git on your machine: https://git-scm.com/book/en/v2/Getting-Started-Installing-Git

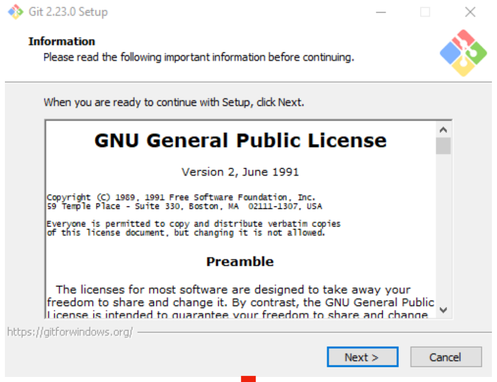
```
tpos-MacBook-Pro:~ student$ git --version
git version 2.23.0
```

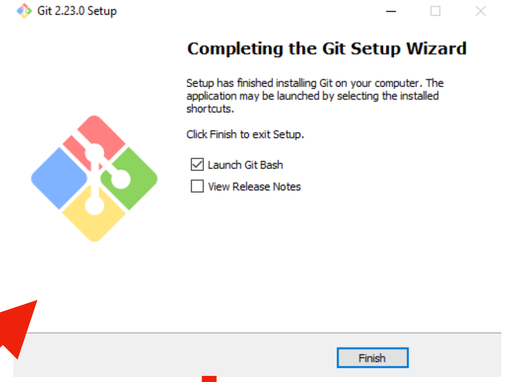
OR

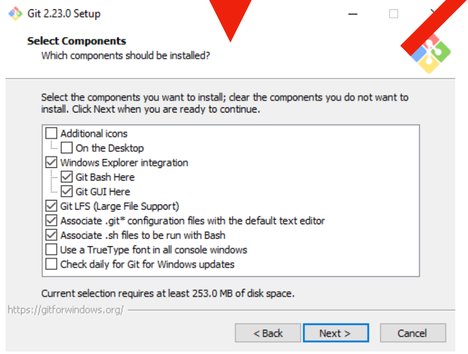


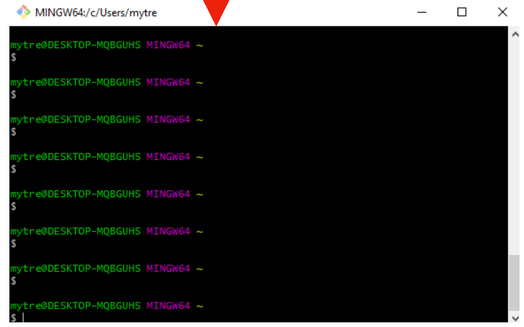






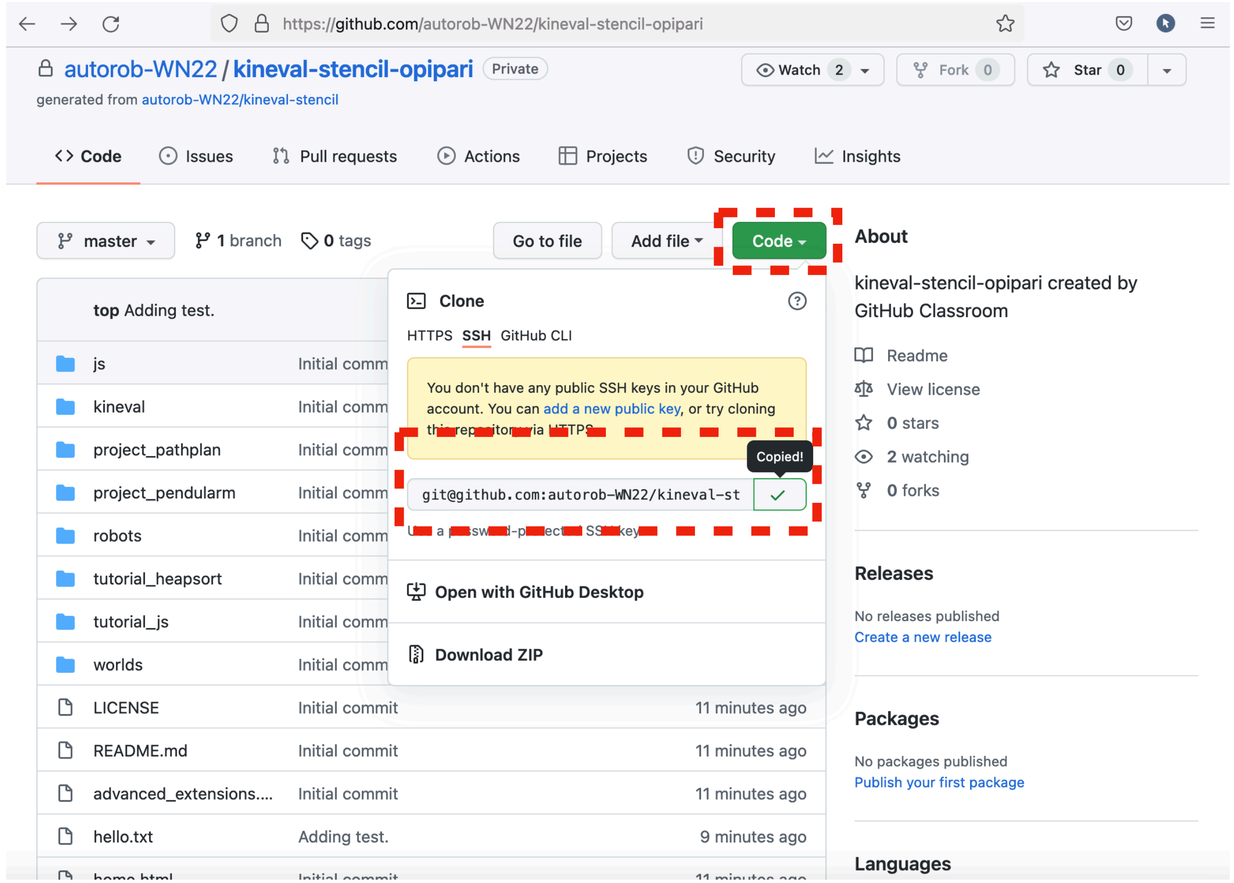




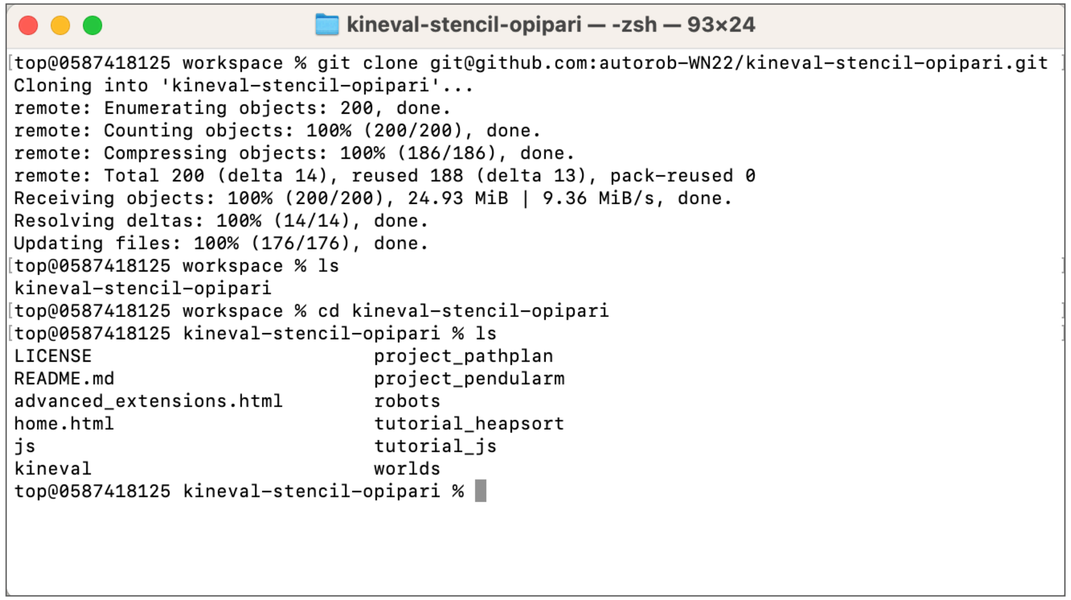


Cloning KinEval Stencil

1) Copy address of remote repository

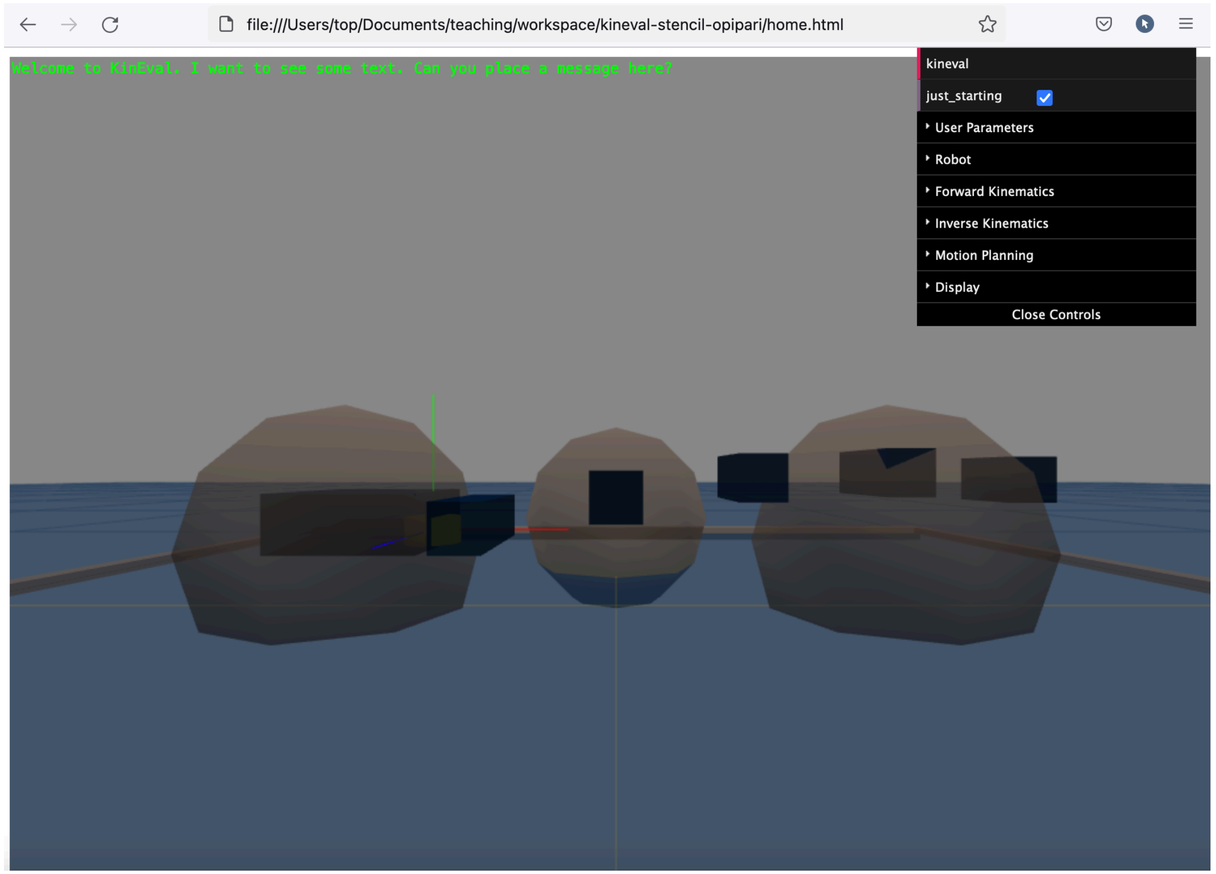


2) Clone repository to your local machine

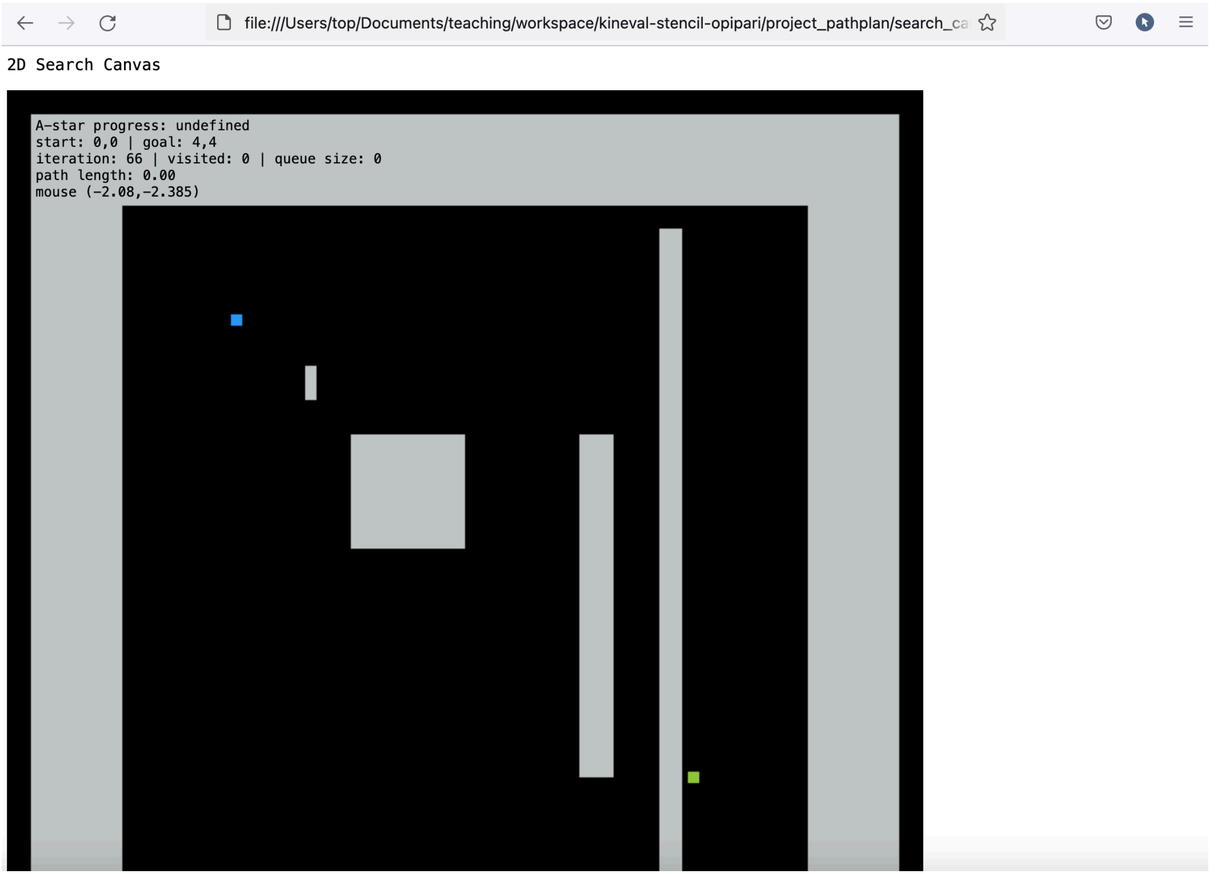


Cloning KinEval Stencil

View “home.html”



View “project_pathplan/search_canvas.html”



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Make a Change, Commit and Push

1) Create “me/me.html” using a text editor with your name added to the file

2) Add “me/me.html” to your local repository

```
cd <your repository directory>
git add me/me.html
```

3) Commit and push “me.html” to your remote repository

```
git commit -a -m “created my html file”
git push
```

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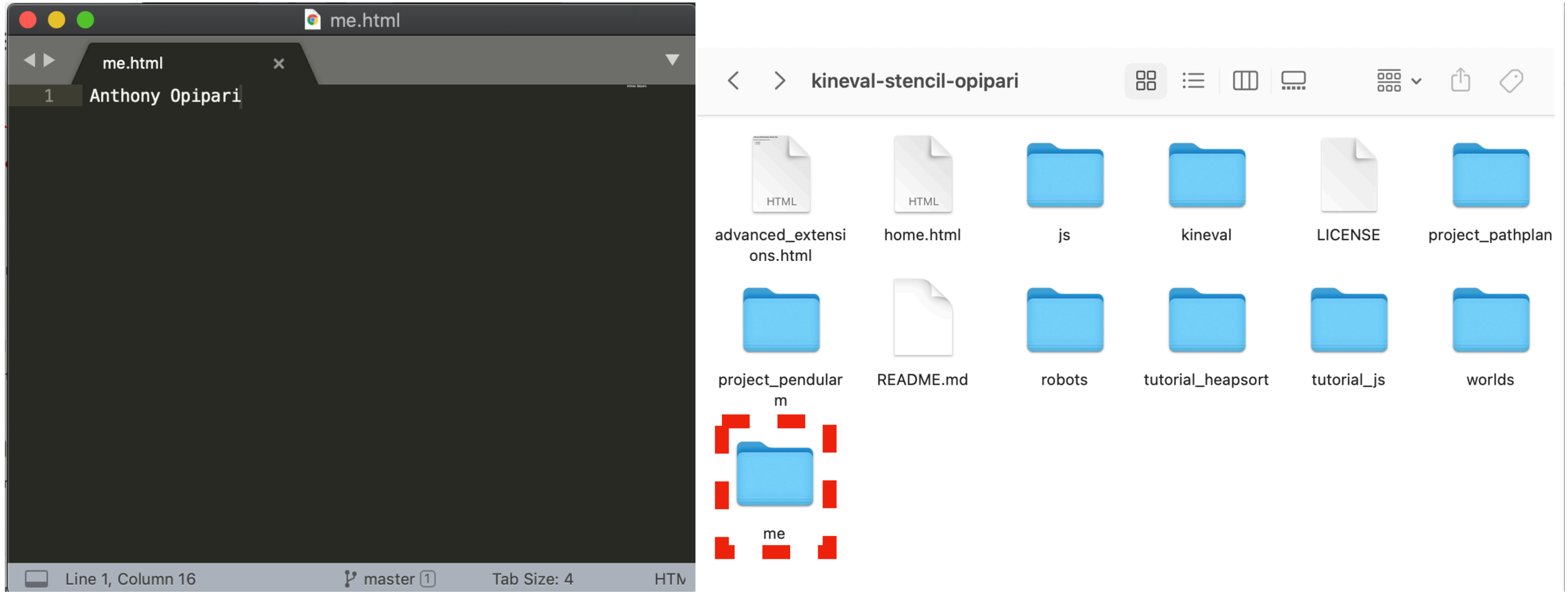

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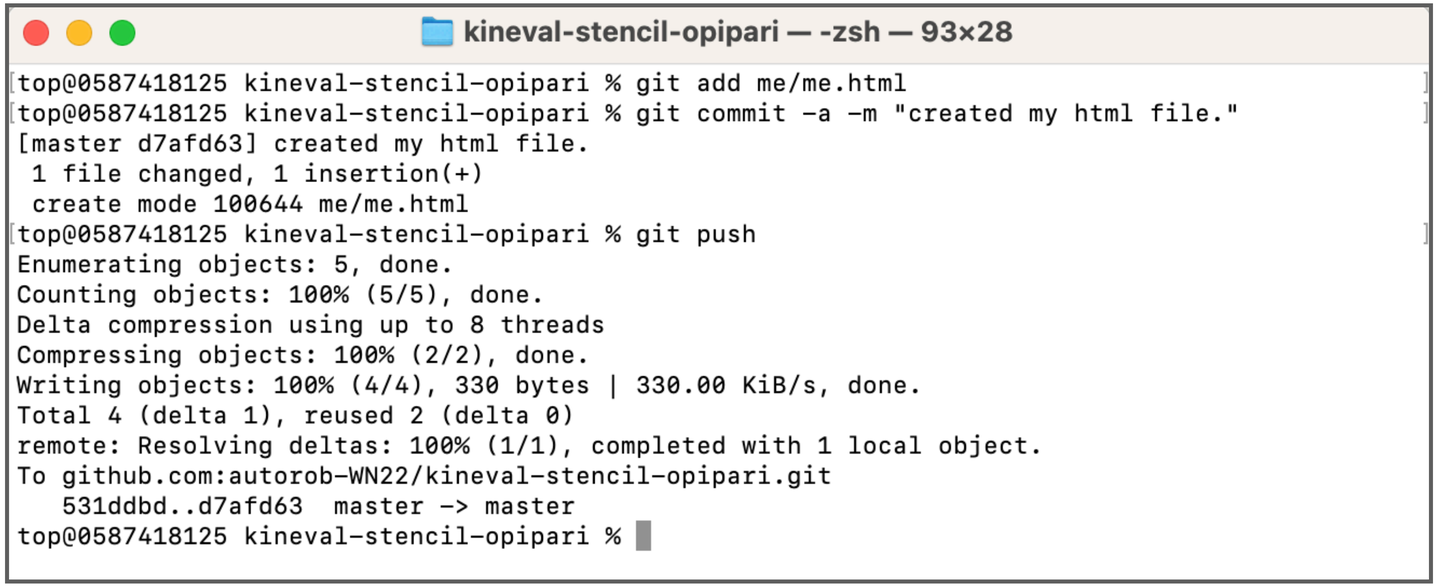

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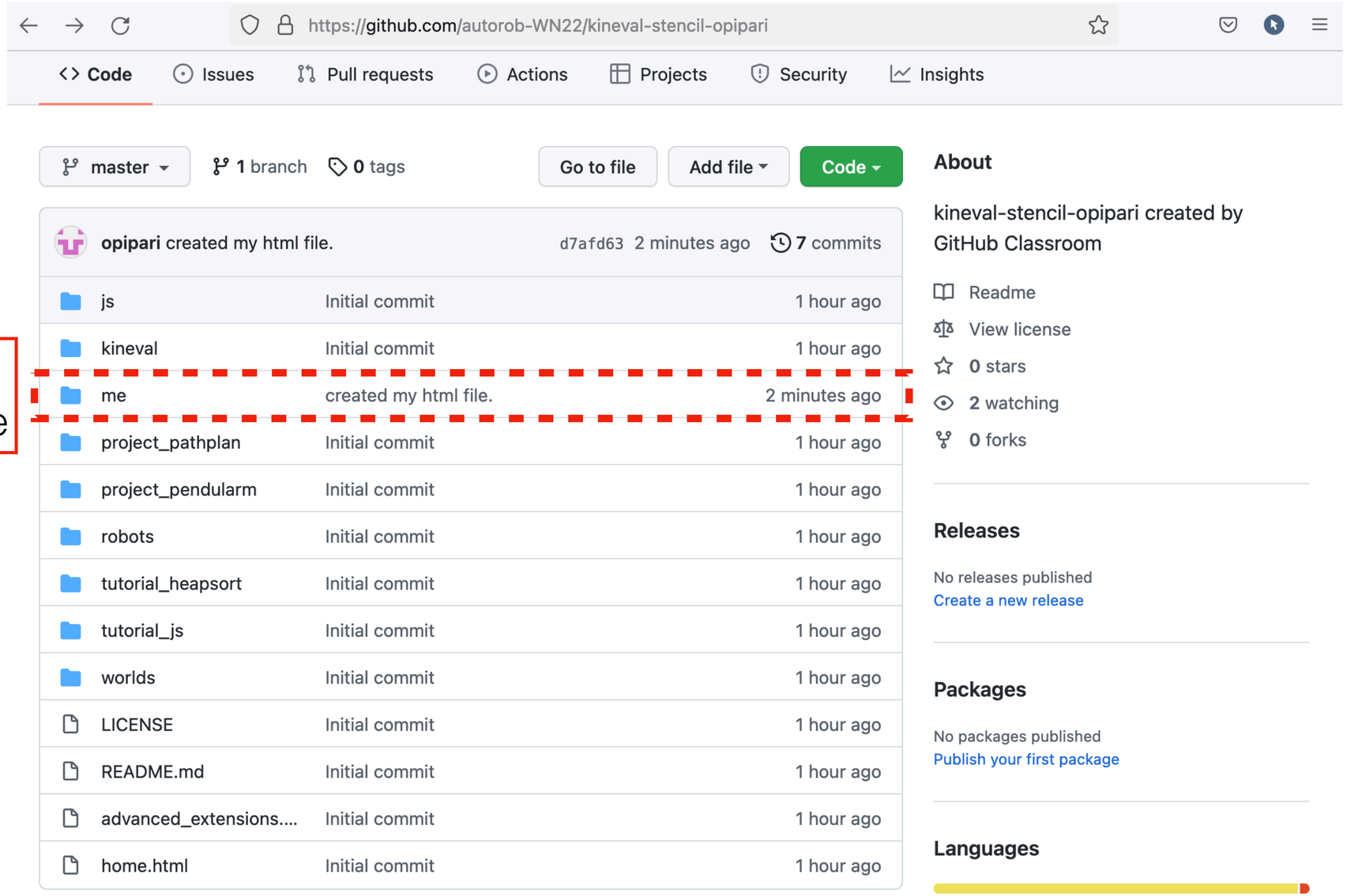
Validate Changes

Check webpage for remote repository to see changes online



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Project 1 Walkthrough

https://autorob.org/#schedule

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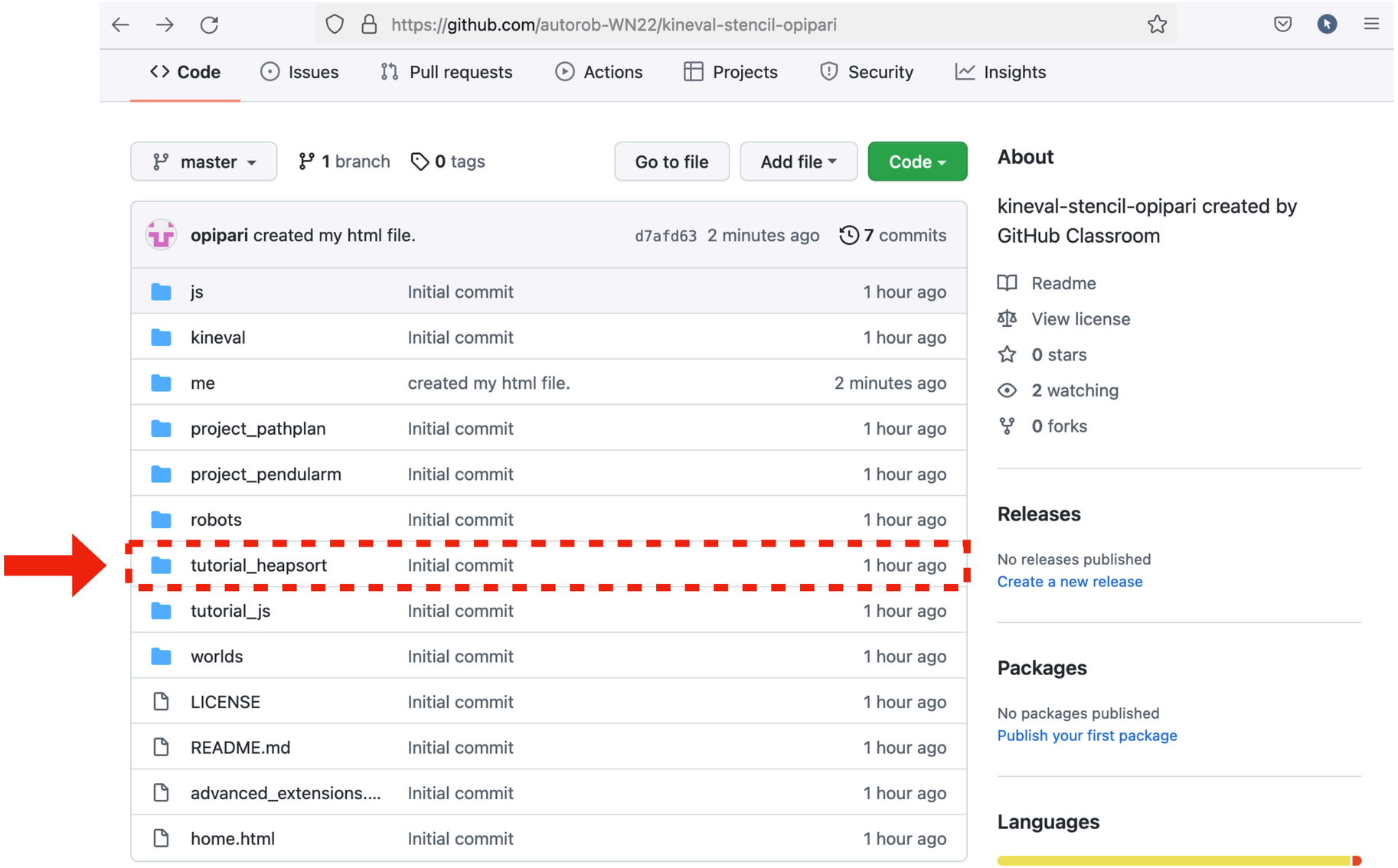
Project Rubrics (tenative and subject to change)

The following project features are planned for AutoRob this semester. Students are expected to complete all features.

Points	Feature
	Assignment 1: 2D Path Planning
4	Heap implementation
8	A-star search
	Assignment 2: Pendularm
4	Euler integrator
4	Velocity Verlet integrator
4	PID control
	Assignment 3: Forward Kinematics
2	Core matrix routines
8	FK transforms
2	Joint selection/rendering
	Assignment 4: Dance Controller
6	Quaternion joint rotation
2	Interactive base control
2	Pose setpoint controller
2	Dance FSM
	Assignment 5: Inverse Kinematics
6	Manipulator Jacobian
3	Gradient descent with Jacobian transpose
3	Jacobian pseudoinverse

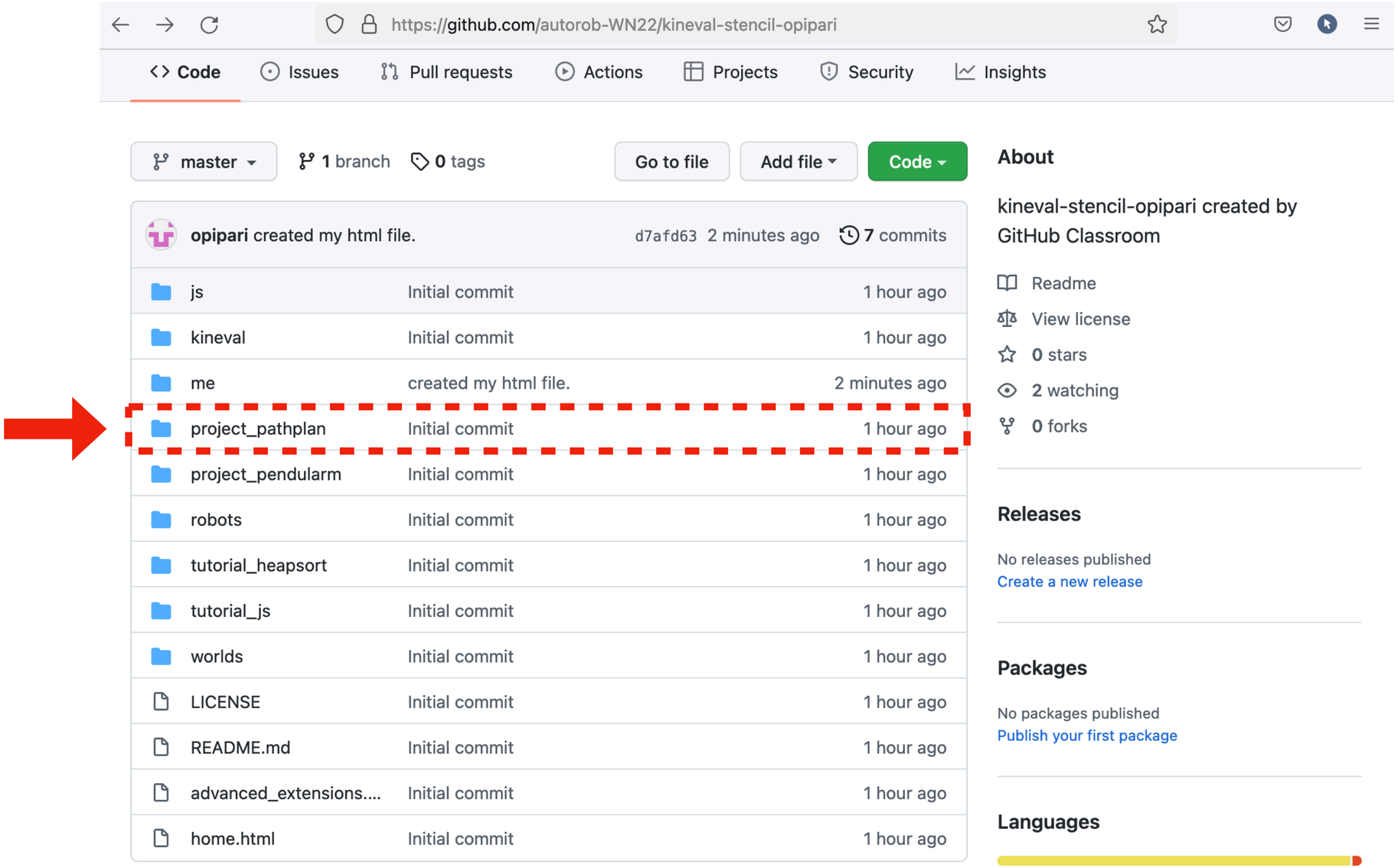
Project 1 Walkthrough

Recommended starting point for project 1



Project 1 Walkthrough

Graded component of project 1



Basic Git Commands

`git init`

start a new, blank repository in your working directory

`git clone <repo address>`

copy an existing repository from the cloud into your working directory

Basic Git Commands

`git add <filename>`

add a file to the index, a.k.a. “stage” it

`git commit –m “message”`

save all of the edits to the files currently in the index as a “commit”

`git push`

push local changes to the default remote repository

`git push <remote> <branch>`

push local changes to a specific remote repository

Basic Git Commands

`git status`

list which files in the workspace have been modified and which have been added to the index

Basic Git Commands

`git remote -v`

lists the addresses of your remote repositories

`git remote add <name> <address>`

adds a new remote

`git remote rename <old-name> <new-name>`

renames an existing remote

Git Resources: Tutorials

1. Course website
    - https://autorob.org/#git_tutorial
2. Pro Git book
    - https://git-scm.com/book/en/v2
3. Learn git branching
    - https://learngitbranching.js.org
4. Visual git reference
    - https://marklodato.github.io/visual-git-guide/index-en.html

Git Resources: SSH Keys

1. GitHub Setup
    - https://docs.github.com/en/enterprise-server@3.0/authentication/connecting-to-github-with-ssh/adding-a-new-ssh-key-to-your-github-account

- SSH keys allow for passwordless authentication
    - push/pull access without 'logging in’

Git Resources: Your Computer

`git --help` and `git <command> -h`