

从0开始的CS61b生活 V1.0

1.大体介绍

课程主页:<https://sp18.datastructur.es/index.html>

Calendar

Week	Date	Reading	Lecture	Discussion	Lab	Assignments/Exams
1	Wed 1/17	1.1	1. Intro, Hello World Java [video] [slides] [guide]	Intro to Java [solution]	Setting Up Your Computer	HW 0: Basic Java Programs (optional)
	Fri 1/19	1.2	2. Defining and Using Classes [video] [slides] [guide]		javac, java, git (due 1/26)	
2	Mon 1/22	2.1	3. References, Recursion, and Lists [video] [slides] [guide]	Scope, Pass-by-Value, Static [slides] [solution]	IntelliJ Home Setup IDEs (due 1/26)	Project 0: NBody (due 1/26 @ 11:59PM)
	Wed 1/24	2.2	4. SLLists, Nested Classes, Sentinel Nodes [video] [slides] [guide]	Scope, Pass-by-Value, Static Exam Prep [solution]		
	Fri 1/26	2.3, 2.4	5. DLLists, Arrays [video] [slides] [guide]			
3	Mon 1/29	2.5	6. ALists, Resizing, vs. SLists [video] [slides] [guide]	Linked Lists, Arrays [slides] [solution]	Testing, Debugging (due 2/2)	Project 1A: Data Structures (due 2/2 @ 11:59 PM)
	Wed 1/31	3.1, Optional: TDD is dead, Unit Tests Are Waste, Response	7. Testing [video] [slides] [guide]	Linked Lists, Arrays Exam Prep [solution]		
	Fri 2/2	4.1	8. Inheritance, Implements [video] [slides] [guide]			
			9. Extends, Casting, Higher			

可以看到在课程主页整体分为Reading,Lecture,Discussion,Lab,Assignments五个部分

Reading

Reading主要是Hug61B这本在线书籍，作为讲课内容的参考与补充，可以发现Reading相当于文字版的Lecture，建议是可以跟着Reading进行学习，每一章里面嵌套一些Lecture视频，相当于一段知识一节视频，对学习节奏很有帮助

Type to search

Hug61B

Introduction

Wrapping up Java Syntax

1. Introduction to Java

1.1 Essentials

1.2 Objects

2. Lists

2.1 Mystery of the Walnut

2.2 The SLList

2.3 The DLList

2.4 Arrays

2.5 The AList

3. Testing

3.1 A New Way

4. Inheritance, Implements

4.1 Intro and Interfaces

4.2 Extends, Casting, Higher Order ...

4.3 Subtype Polymorphism vs. HOFs

4.4 Java Libraries and packages

5. Generics and Autoboxing

5.1 Autoboxing

Running a Java Program

通过以下平台观看:

The most common way to execute a Java program is to run it through a sequence of two programs. The first is the Java compiler, or `javac`. The second is the Java interpreter, or `java`.

For example, to run `HelloWorld.java`, we'd type the command `javac HelloWorld.java` into the terminal, followed by the command `java HelloWorld`. The result would look something like this:

```
$ javac HelloWorld.java
$ java HelloWorld
Hello World!
```

Lecture

包括Video,Slide和Guide，Video可以跟着上面的Reading里面看，这里的Video实际上是一章的全部Video，没有像Reading一样分节，每节课后可以查看Guide巩固理解

Discussion

discussion是一些课后题目，对知识点的加深练习，并附有Solution

Assignments

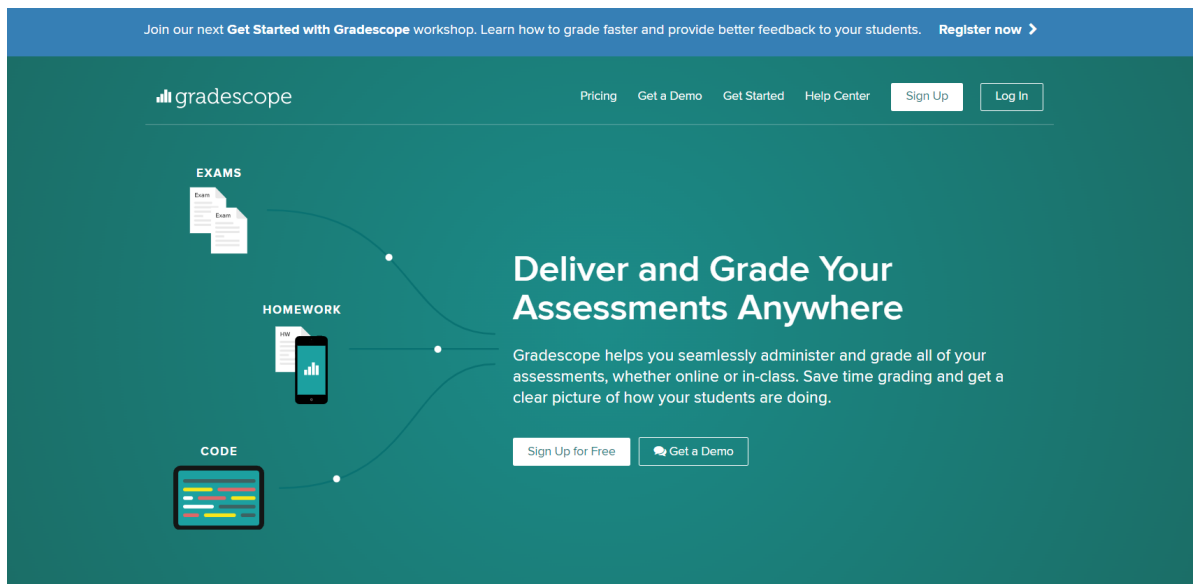
这部分主要是Lab与Project, Homework组成，Spring 2018有14个lab，10个homework以及3个项目，每个作业均有说明文档，来指导你完成

2. 搭建环境

cs61b sp18是采用线上评分的方式，也就是autograder，具体是在gradescope该网站上评测

1. gradescope

网站地址: gradescope.com



注册步骤:

选择Sign Up, Sign up as an **Student**

Join Over 110,000 Instructors

Sign up as an...

Instructor

Student

COURSE ENTRY CODE

MNXYKX

SCHOOL

UC Berkeley

NAME

someone

EMAIL ADDRESS

6666166616@163.com

STUDENT ID

12345

Sign up as a student

课程代码

Spring 2018 : MNXYKX

Spring 2021 : MB7ZPY

区别说明:2018的评测最全, 2021主要是为了写著名项目Gitlet

SCHOOL

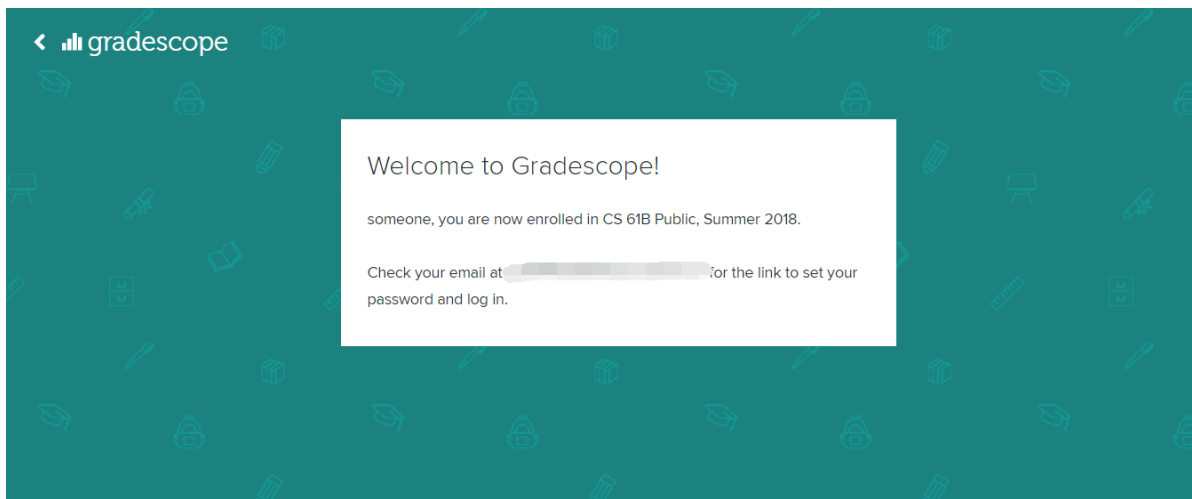
学校请选择**UC Berkeley**, 一定要**拼全**, 否则无法进入

EMAIL ADDRESS

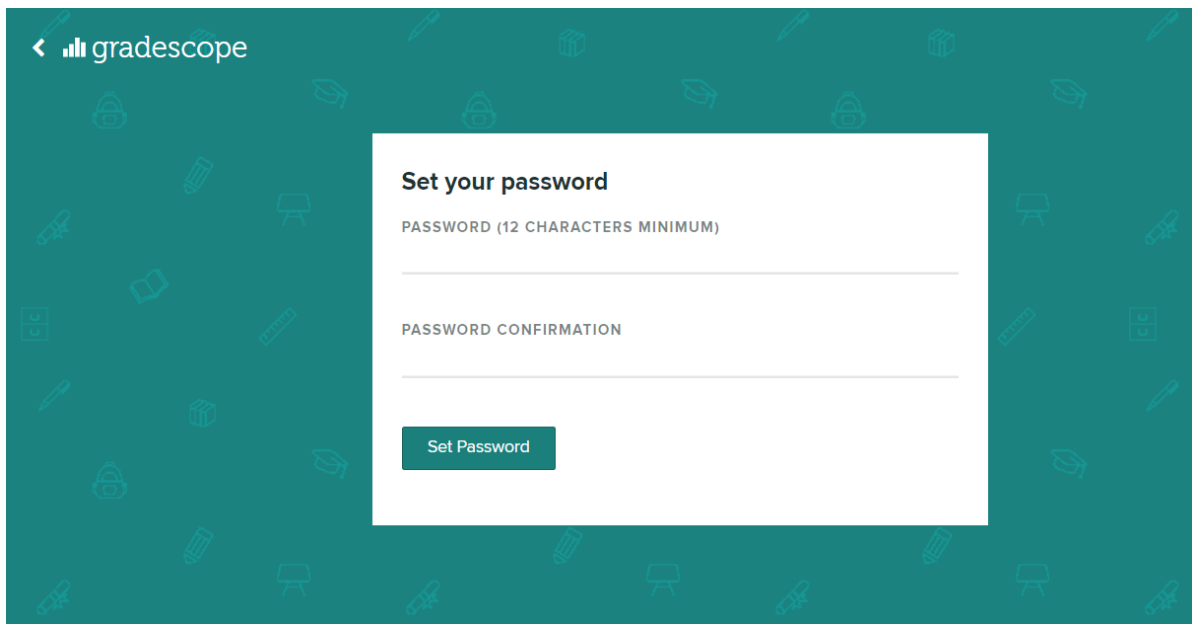
填入一个你自己的邮箱, 不一定是Berkeley的邮箱, 任何邮箱包括QQ邮箱也可

关于NAME和STUDENT ID随便填即可

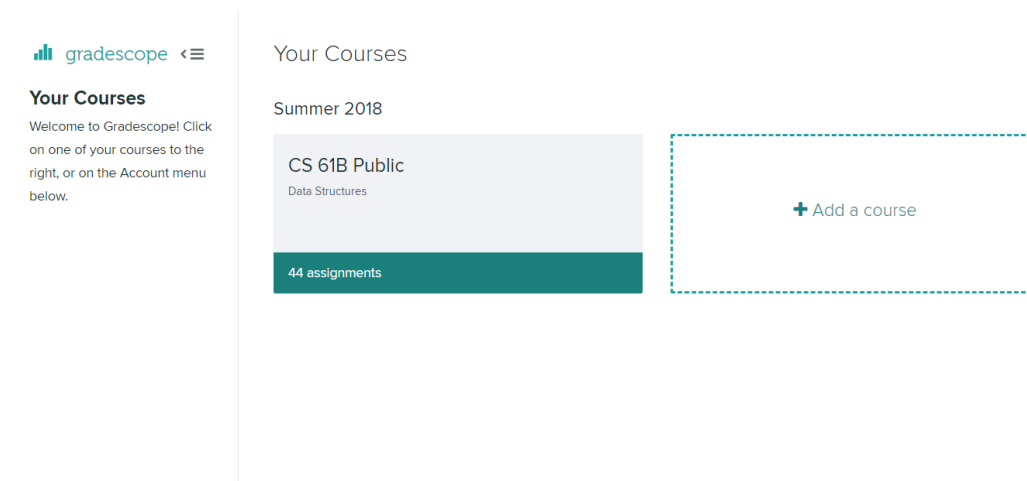
出现以下界面说明注册成功



根据提示进入自己的邮箱，设置初始密码



成功之后进入Gradescope



gradescope <≡

CS 61B Public

Summer 2018

DESCRIPTION

For autograder problems, please email cs61b@berkeley.edu .

NAME	STATUS	RELEASED	DUE (PST)
Lab 3 : Testing, Debugging	No Submission	JUL 12	78 years, 4 months left JUL 12 AT 3:10PM
Project 1 Gold : Randomized Testing	No Submission	JUL 12	78 years, 4 months left JUL 12 AT 3:10PM
Project 2 : Phase 2	No Submission	JUL 12	78 years, 4 months left JUL 12 AT 3:10PM
HW 4 : Puzzle Solver	No Submission	JUL 12	78 years, 4 months left JUL 12 AT 3:10PM
Project 3 : BearMaps Part I	No Submission	JUL 12	78 years, 4 months left JUL 12 AT 3:10PM
Lab 13 : Radix Sorts	No Submission	JUL 12	78 years, 4 months left JUL 12 AT 3:10PM

INSTRUCTORS

Eli Lipsitz

Josh Hug

COURSE ACTIONS

Leave Course

Account

2.Github

网址:<https://github.com/>

由于在gradescope上进行评测是借助于你的远程仓库上的代码库，因此实际操作过程中需要将你的本地代码上传到Github并提交评测

首先去注册一个Github的账号，然后新建一个远程仓库，该步骤比较简单

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere?
[Import a repository.](#)

Owner *

Fallenpetal

Repository name *

CS61B Tutorial

Great repository names are Your new repository will be created as CS61B-Tutorial. out congenial-giggle?

Description (optional)

☒ Public

Anyone on the internet can see this repository. You choose who can commit.

☐ Private

You choose who can see and commit to this repository.

Initialize this repository with:

Skip this step if you're importing an existing repository.

☐ Add a README file

This is where you can write a long description for your project. [Learn more.](#)

☐ Add .gitignore

Choose which files not to track from a list of templates. [Learn more.](#)

☐ Choose a license

A license tells others what they can and can't do with your code. [Learn more.](#)

Create repository

新建成功后出现

Quick setup — if you've done this kind of thing before

Set up in Desktop or HTTPS SSH <https://github.com/Fallenpetal/CS61B-Tutorial.git>

Get started by [creating a new file](#) or [uploading an existing file](#). We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#).

...or create a new repository on the command line

```
echo "# CS61B-Tutorial" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M master
git remote add origin https://github.com/Fallenpetal/CS61B-Tutorial.git
git push -u origin master
```

...or push an existing repository from the command line

```
git remote add origin https://github.com/Fallenpetal/CS61B-Tutorial.git
git branch -M master
git push -u origin master
```

...or import code from another repository

You can initialize this repository with code from a Subversion, Mercurial, or TFS project.

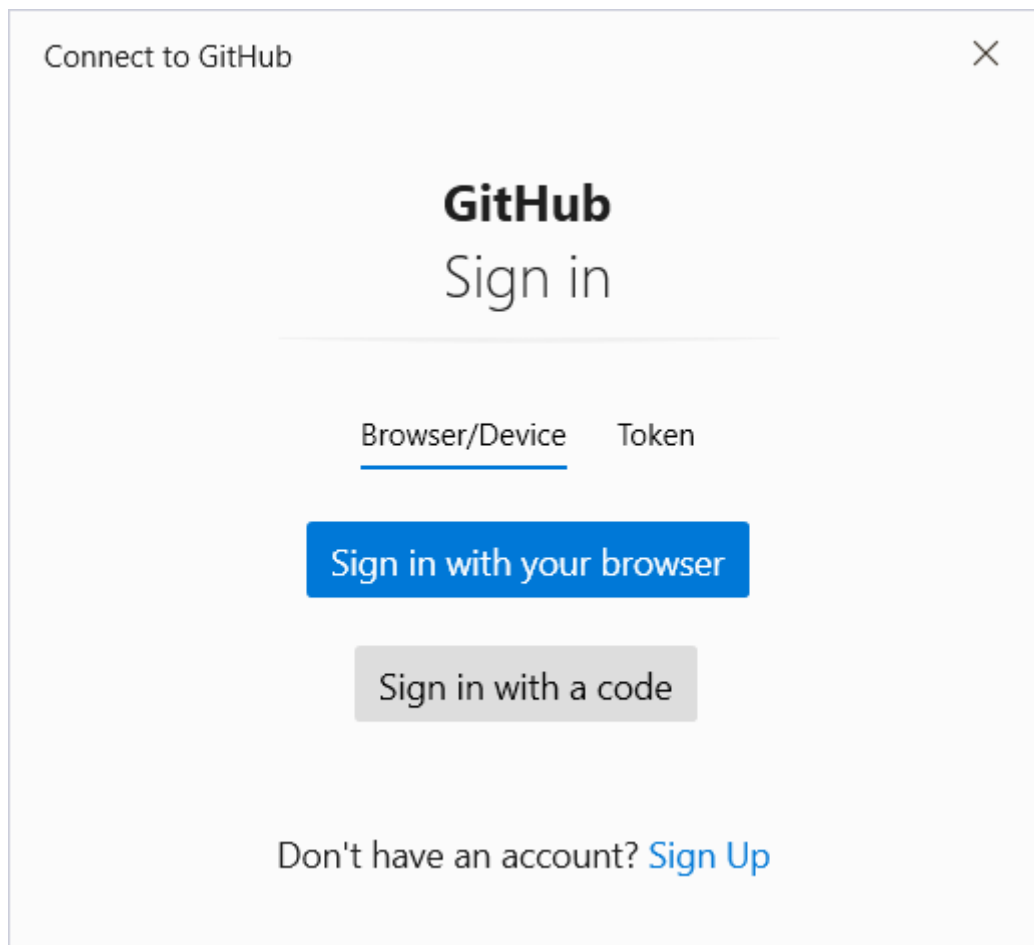
[Import code](#)

记住自己的链接，上方的SSH

例如 [git@github.com:Fallenpetal/CS61B-Tutorial.git](https://github.com/Fallenpetal/CS61B-Tutorial.git)

配置SSH Key

原本使用https链接进行上传是对新手很友好的，在上传时只需要验证一下账户密码即可，类似这样



但是github在2021年8月13日取消了账户密码的验证，详见 <https://github.blog/2020-12-15-token-authentication-requirements-for-git-operations/>

配置token更加麻烦，因此推荐配置SSH密钥较为简单，一个关于配置SSH密钥的教程

<https://www.cnblogs.com/yuqiliu/p/12551258.html>

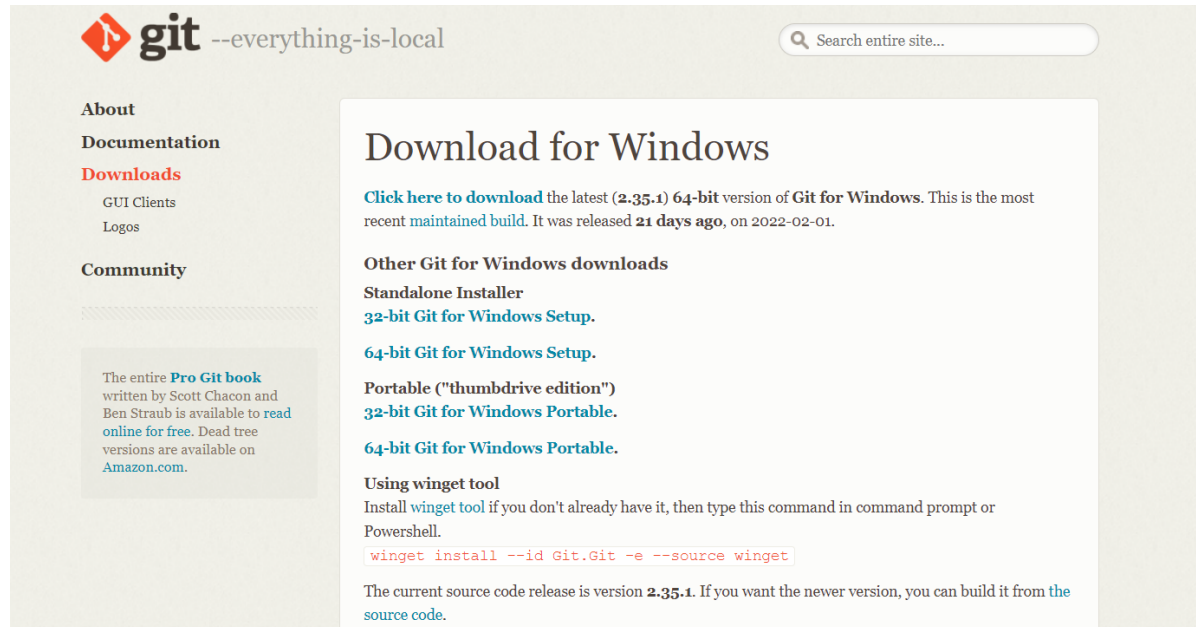
由于该教程写的非常全面，我就不需要再写一遍了

3.安装Git

Github只是你的远程托管，相当于网盘，而将本地代码上传到网盘则使用Git

在Windows上安装Git

官网:<https://git-scm.com/download/win>



选择合适的版本安装，各种选项目前均可默认

安装完成后，在开始菜单里找到“Git”->“Git Bash”，蹦出一个类似命令行窗口的东西，就说明Git安装成功！

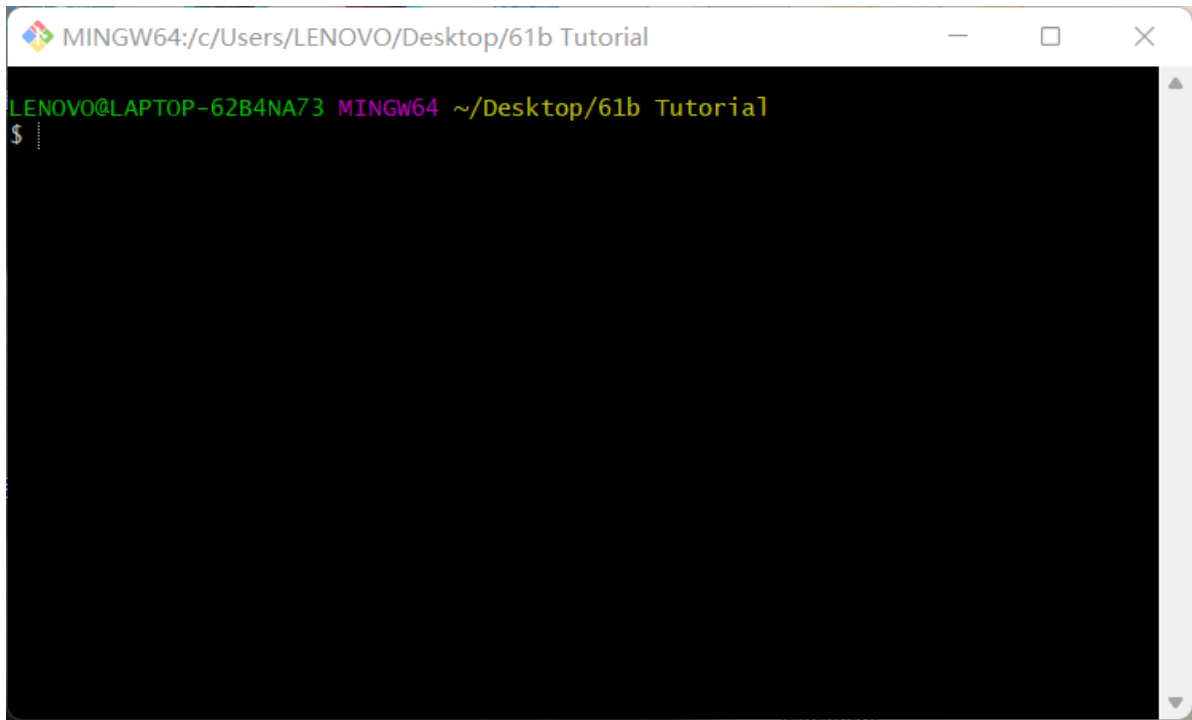
安装完成后，需要设置使用者的邮箱和用户名，在Git Bash中输入：

```
$ git config --global user.name "Your Name"
$ git config --global user.email "email@example.com"
```

MacOS与Linux的安装请自行google

4.建立本地仓库

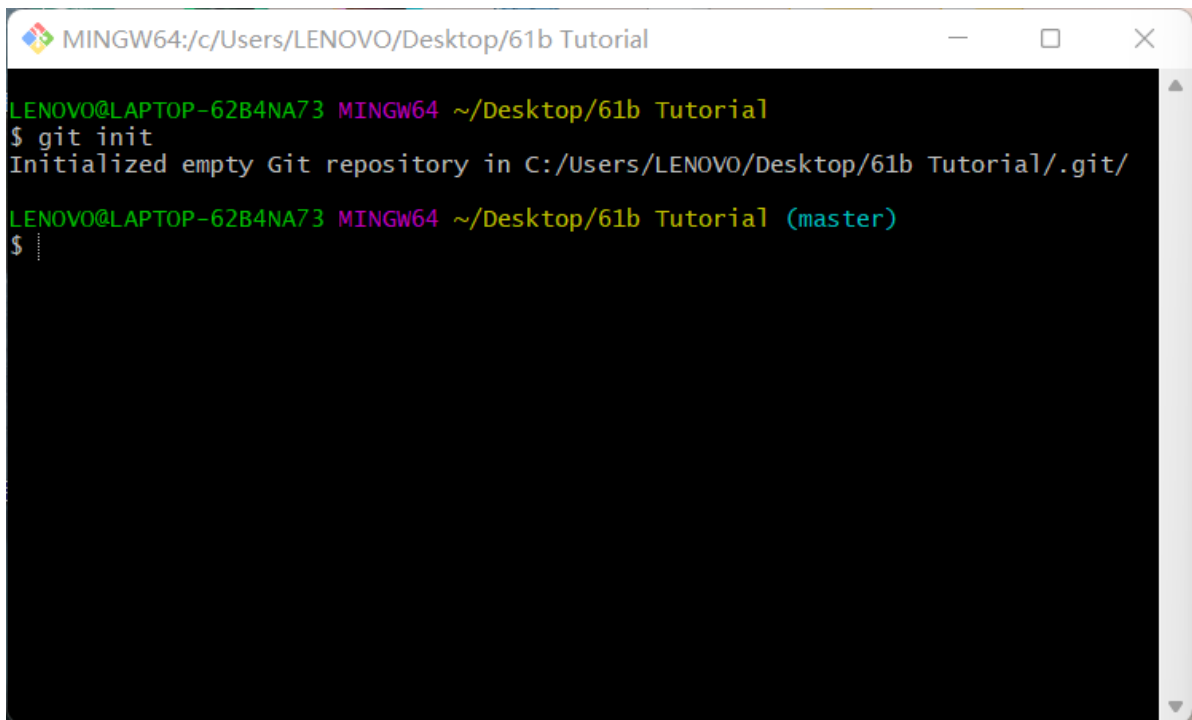
在电脑上新建一个文件夹，这个文件夹相当于你以后写代码的地方，也就是以后的61b代码都存储在这里，之后打开文件夹，右键选择**Git Bash Here**，弹出以下窗口

A terminal window titled 'MINGW64:/c/Users/LENOVO/Desktop/61b Tutorial'. The prompt is 'LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial' followed by a '\$' symbol and a cursor.

执行命令

```
git init
```

进行本地仓库初始化

A terminal window titled 'MINGW64:/c/Users/LENOVO/Desktop/61b Tutorial'. The prompt is 'LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial'. The user enters '\$ git init', and the output is 'Initialized empty Git repository in C:/Users/LENOVO/Desktop/61b Tutorial/.git/'. The prompt then changes to 'LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial (master)' followed by a '\$' symbol and a cursor.

5. 获取Skeleton代码

由于61b每个项目都有一定的框架代码，我们需要这些代码的辅佐。

在刚才的**Git Bash**里面，执行命令：

```
git pull https://github.com/Berkeley-CS61B/skeleton-sp18.git
```


等待片刻后，出现

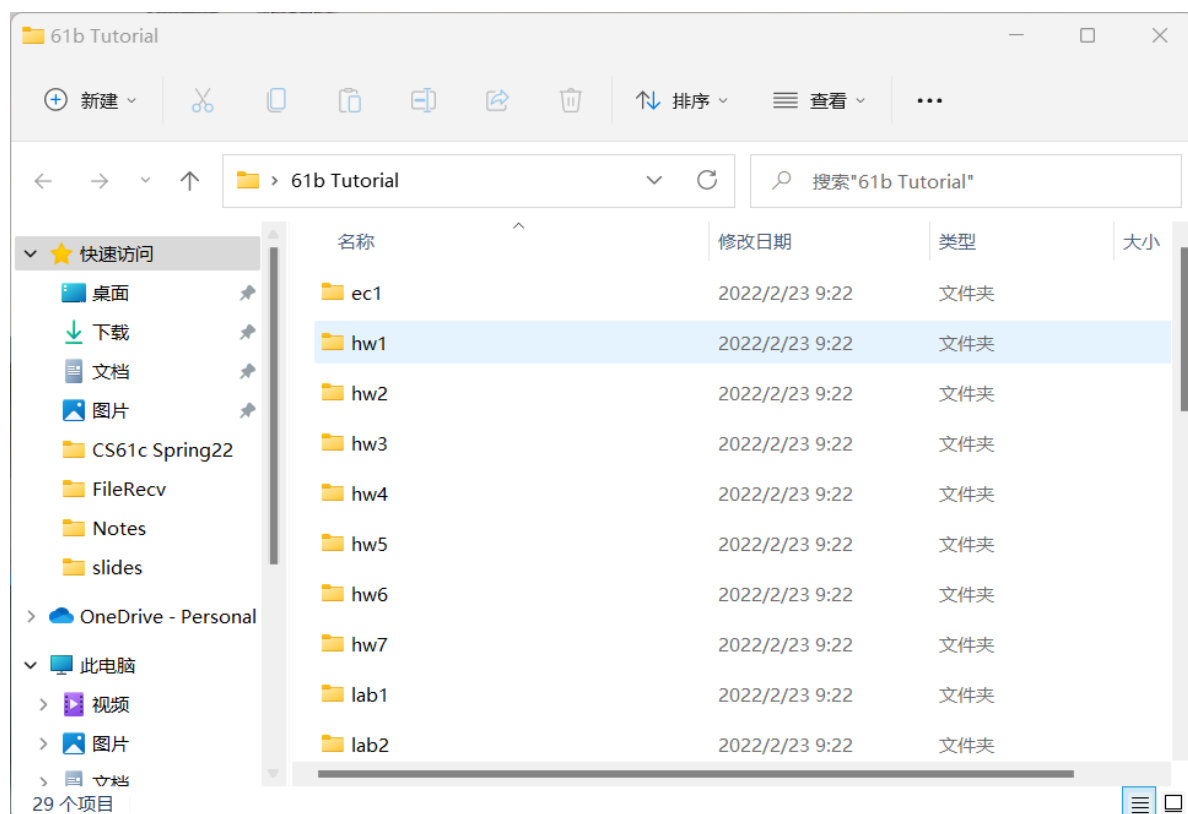
```
MINGW64:/c:/Users/LENOVO/Desktop/61b Tutorial

LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial
$ git init
Initialized empty Git repository in C:/Users/LENOVO/Desktop/61b Tutorial/.git/

LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial (master)
$ git pull https://github.com/Berkeley-CS61B/skeleton-sp18.git
remote: Enumerating objects: 1017, done.
Receivinremote: Total 1017 (delta 0), reused 0 (delta 0), pack-reused 1017
Receiving objects: 100% (1017/1017), 3.44 MiB | 1.98 MiB/s, done.
Resolving deltas: 100% (260/260), done.
From https://github.com/Berkeley-CS61B/skeleton-sp18
* branch          HEAD              -> FETCH_HEAD

LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial (master)
$
```

则成功，此时点开刚才我们新建的本地文件夹，发现里面 多了很多文件，这些就是skeleton代码



3.进行代码作业

之后的课程lab,project,homework均在框架代码的基础上进行编写，现在模拟一下第一次写lab并提交到gradescope上评测的过程

Spring 2018 lab1 闰年判断

地址:<https://sp18.datastructur.es/materials/lab/lab1/lab1#f-leap-year>

lab内容描述:

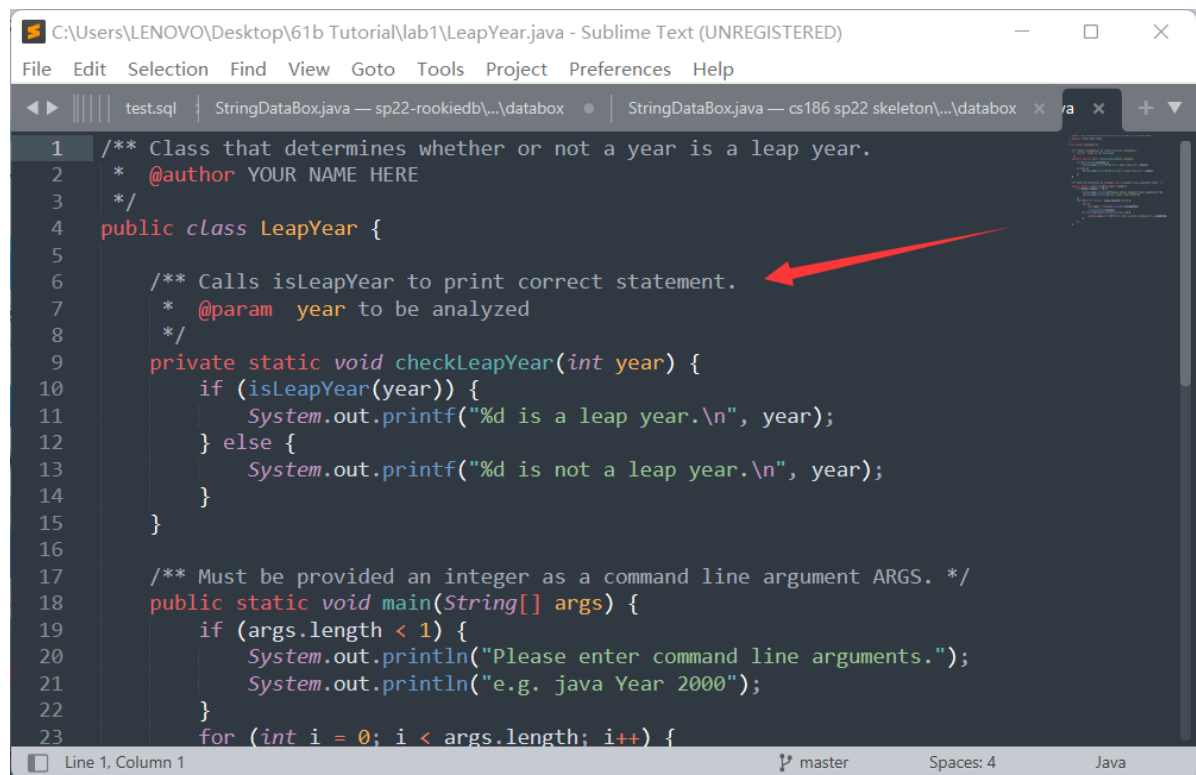
闰年是:

- 可被 400 整除或
- 能被 4 整除, 不能被 100 整除。

例如, 2000 年和 2004 年是闰年。1900、2003 和 2100 不是闰年。

你的目标:编写一个函数方法判断一个年份是否是闰年

进入本地的61b文件夹, 可以看到有一个lab1文件夹, 点击进入, 打开里面的LeapYear.java文件



```
1  /** Class that determines whether or not a year is a leap year.
2  *   @author YOUR NAME HERE
3  */
4  public class LeapYear {
5
6      /** Calls isLeapYear to print correct statement.
7       *   @param year to be analyzed
8       */
9      private static void checkLeapYear(int year) {
10         if (isLeapYear(year)) {
11             System.out.printf("%d is a leap year.\n", year);
12         } else {
13             System.out.printf("%d is not a leap year.\n", year);
14         }
15     }
16
17     /** Must be provided an integer as a command line argument ARGS. */
18     public static void main(String[] args) {
19         if (args.length < 1) {
20             System.out.println("Please enter command line arguments.");
21             System.out.println("e.g. java Year 2000");
22         }
23         for (int i = 0; i < args.length; i++) {
```

在箭头处使用Java语法编写一个函数判断是否是闰年,答案仅供参考:

```
public static boolean isLeapYear(int year){
    return ((year%4==0&&year%100!=0) || year%400==0);
}
```

运行Java程序

首先需要安装Java

官网:<https://www.oracle.com/java/technologies/downloads/#jdk17-windows>

默认下载安装即可, 安装完毕后打开cmd, 运行

```
java --version
```

```
命令提示符
Microsoft Windows [版本 10.0.22000.527]
(c) Microsoft Corporation。保留所有权利。

C:\Users\LENOVO>java --version
java 16.0.1 2021-04-20
Java(TM) SE Runtime Environment (build 16.0.1+9-24)
Java HotSpot(TM) 64-Bit Server VM (build 16.0.1+9-24, mixed mode, sharing)

C:\Users\LENOVO>
```

则说明安装成功，回到刚才**LeapYear.java**处的文件夹内，右键打开GitBash，执行

```
javac 文件名.java
```

进行编译，此处则是

```
javac LeapYear.java
```

编译完成后会生成.class文件，暂时先不管，继续执行

```
java 文件名 arguments
```

在文件名后隔一个空格输入一个参数，此处则是

```
java LeapYear 2000
```

表示判断2000是不是闰年

```
LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$ javac LeapYear.java

LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$ java LeapYear
Please enter command line arguments.
e.g. java Year 2000

LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$ java LeapYear 2000
2000 is a leap year.

LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$
```

完成该lab

最开始的几周是使用**javac**，**java**的 命令行进行编译，之后会使用**IntelliJ IDEA**，网站也会教大家配置

4.上传代码至Github

在完成自己的代码作业后，需要提交到gradescope上进行评测，而gradescope是读取你的github上的代码仓库，因此此处需要先将本地代码上传至github：

1.绑定你的远程仓库

步骤2中，你已经创建了一个远程仓库，并记下仓库的SSH链接，for example:

```
git@github.com:Fallenpetal/CS61B-Tutorial.git
```

接下来需要将本地仓库与远程仓库进行关联：

回到刚才的文件夹里，打开Git Bash,执行：

```
git remote add origin 你的仓库链接
```

此处示例则是：

```
git remote add origin git@github.com:Fallenpetal/CS61B-Tutorial.git
```

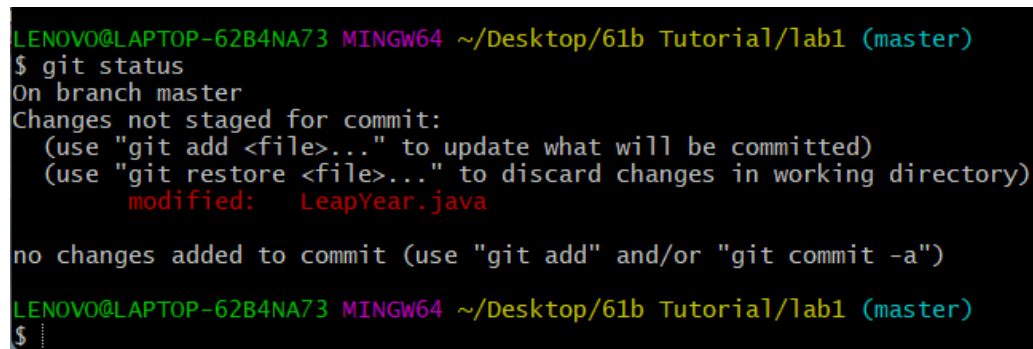
绑定完成

2.查看当前仓库状态与上传

执行命令：

```
git status
```

可以查看当前仓库状态

A terminal window screenshot showing the output of the 'git status' command. The prompt is 'LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)'. The output indicates the current branch is 'master' and that there are changes not staged for commit. It lists 'LeapYear.java' as modified. It also provides instructions on how to stage changes using 'git add' or discard them using 'git restore'.

```
LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   LeapYear.java

no changes added to commit (use "git add" and/or "git commit -a")
LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$
```

可以发现标红处正是刚才我们修改的代码，接下来将代码上传至github：

执行：

```
git add LeapYear.java
```

Optional:如果需要添加的文件很多，也可以使用

```
git add --all
```

一次性添加所有代码，然后执行：

```
git commit -m"填写一些你想说明的信息"
```

示例:

```
LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$ git add --all

LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$ git commit -m"第一次提交"
[master 3a87206] 第一次提交
1 file changed, 4 insertions(+), 2 deletions(-)
```

最后执行

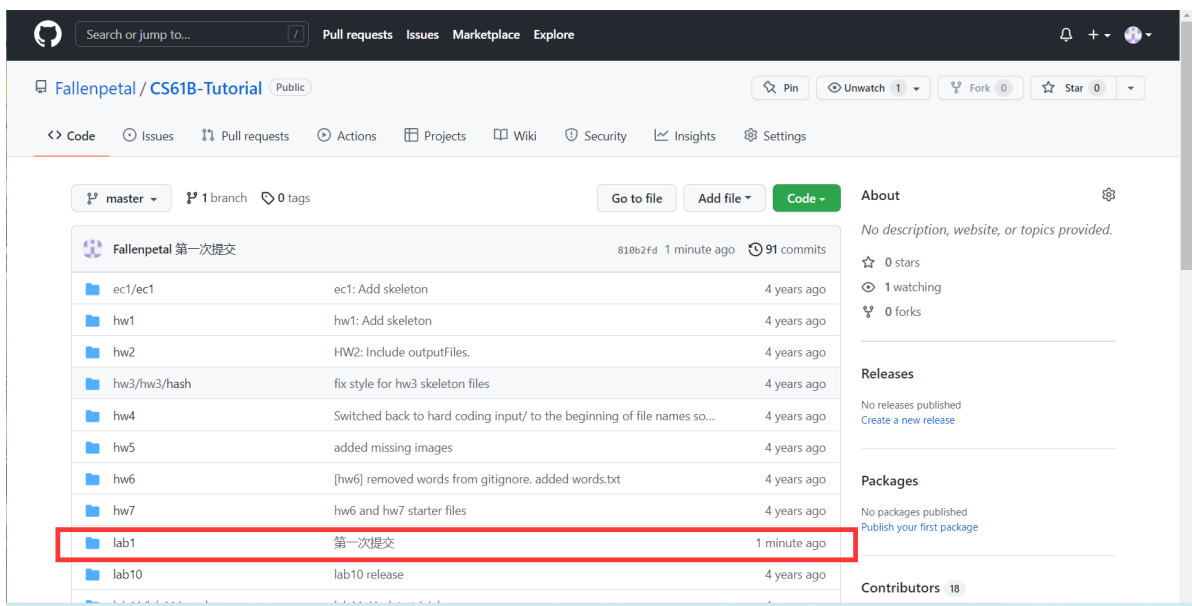
```
git push origin master
```

静待片刻后, 出现

```
LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$ git push origin master
Enumerating objects: 1021, done.
Counting objects: 100% (1021/1021), done.
Delta compression using up to 8 threads
Compressing objects: 100% (612/612), done.
Writing objects: 100% (1021/1021), 3.44 MiB | 285.00 KiB/s, done.
Total 1021 (delta 262), reused 1015 (delta 260), pack-reused 0
remote: Resolving deltas: 100% (262/262), done.
To github.com:Fallenpetal/CS61B-Tutorial.git
 * [new branch]      master -> master

LENOVO@LAPTOP-62B4NA73 MINGW64 ~/Desktop/61b Tutorial/lab1 (master)
$
```

此时再去查看Github的远程仓库, 发现本地代码已经全部上传至Github



5.Gradescope评测

由于spring 2018的lab1已过期, 作为测试, 我们可以选择spring 2021的版本进行Lab1的测试 (只是lab1选择Spring2021进行测试, 其余的lab以2018为准)

Spring 2021 : MB7ZPY

gradescope <≡

CS 61B (Public) | Spring 2021

DESCRIPTION

In 61A, the correctness of a program was our primary goal. In CS 61B, we're concerned also with engineering. An engineer, it is said, is someone who can do for a dime what any fool can do for a dollar. Much of 61B will be concerned with the tradeoffs in time and memory for a variety of methods for structuring data. We'll also be concerned with the engineering knowledge and skills needed to build and maintain moderately large programs.

NAME	STATUS	RELEASED	DUE (PST)
Lab 1: Welcome to Java	No Submission	SEP 01	1 year, 10 months left DEC 31 AT 11:59PM LATE DUE DATE: DEC 31 AT 11:59PM
Lab 2: Debugging	No Submission	SEP 01	1 year, 10 months left DEC 31 AT 11:59PM LATE DUE DATE: DEC 31 AT 11:59PM
Lab 3: Randomized Testing and Timing	No Submission	SEP 01	1 year, 10 months left DEC 31 AT 11:59PM LATE DUE DATE: DEC 31 AT 11:59PM
Lab 4: Debugging	No Submission	SEP 01	1 year, 10 months left DEC 31 AT 11:59PM LATE DUE DATE: DEC 31 AT 11:59PM

Account

选择Lab1,提交方式选择Github

gradescope <≡

CS 61B (Public) | Spring 2021

DESCRIPTION

In 61A, the correctness of a program was our primary goal. In CS 61B, we're concerned also with engineering. An engineer, it is said, is someone who can do for a dime what any fool can do for a dollar. Much of 61B will be concerned with the tradeoffs in time and memory for a variety of methods for structuring data. We'll also be concerned with the engineering knowledge and skills needed to build and maintain moderately large programs.

Submit Programming Assignment

Upload all files for your submission

SUBMISSION METHOD

☐ Upload ☒ GitHub ☐ Bitbucket

CONNECT YOUR ACCOUNT

[Connect to GitHub](#)

REPOSITORY

Select a repository...

BRANCH

Select a branch...

Upload Cancel

NAME	STATUS	RELEASED	DUE (PST)
Lab 1: Welcome to Java	No Submission	SEP 01	1 year, 10 months left DEC 31 AT 11:59PM LATE DUE DATE: DEC 31 AT 11:59PM
Lab 2: Debugging	No Submission	SEP 01	1 year, 10 months left DEC 31 AT 11:59PM LATE DUE DATE: DEC 31 AT 11:59PM
Lab 3: Randomized Testing and Timing	No Submission	SEP 01	1 year, 10 months left DEC 31 AT 11:59PM LATE DUE DATE: DEC 31 AT 11:59PM
Lab 4: Debugging	No Submission	SEP 01	1 year, 10 months left DEC 31 AT 11:59PM LATE DUE DATE: DEC 31 AT 11:59PM

Account

正在等待代理服务器的响应...

选择自己的仓库和分支（注意要选对，也就是说你的代码在哪个分支就选哪个，有可能是main，只是名字而已）

Submit Programming Assignment

 Upload all files for your submission

SUBMISSION METHOD

☐  Upload ☒  GitHub ☐  Bitbucket

REPOSITORY

Fallenpetal/CS61B-Tutorial


BRANCH

master

Upload

Cancel

最后等待评测结果即可



Autograder Results

ResultsCode

Advice from your friendly neighborhood Academic Intern:
'Deeply understanding every project and HW is essential.'

File Checking (0.0/0.0)

* Found required files for Lab.

Compilation (0.0/0.0)

Compiling tests for Lab...
Success.

a001) HelloNumbers (16.0/16.0)

Your HelloNumbers output: 0 1 3 6 10 15 21 28 36 45
Expected output: 0 1 3 6 10 15 21 28 36 45

b001) Collatz (16.0/16.0)

Your Collatz output: 5 16 8 4 2 1
Expected output: 5 16 8 4 2 1

STUDENT
liuxing

AUTOGRADER SCORE
32.0 / 32.0

PASSED TESTS

File Checking (0.0/0.0)
Compilation (0.0/0.0)
a001) HelloNumbers (16.0/16.0)
b001) Collatz (16.0/16.0)

最后说明一下，本案例只是教大家如何编写Java程序，编译运行并提交，**实际上Spring 2021 的lab1不是判断闰年，望周知**，按照以上步骤提交会出现下图(因为不是同一个lab哈哈哈)，右上角即为打分

Advice from your friendly neighborhood Academic Intern:
'Start projects early.'

File Checking (0.0/0.001)

* Missing required files for Lab:
- HelloNumbers.java
- Collatz.java

Assessment for Lab (0.0/32.0)

Unable to run assessment for Lab: missing required files

STUDENT
someone

AUTOGRADER SCORE
0.0 / 32.0

FAILED TESTS

File Checking (0.0/0.001)
Assessment for Lab (0.0/32.0)

提交作业的流程

以后的作业过程均为以上步骤，在写完代码后，提交即可，具体git 命令：

`git status` 查看当前仓库状态，标红文件即为修改的文件

`git add --all`

`git commit -m"说明"`

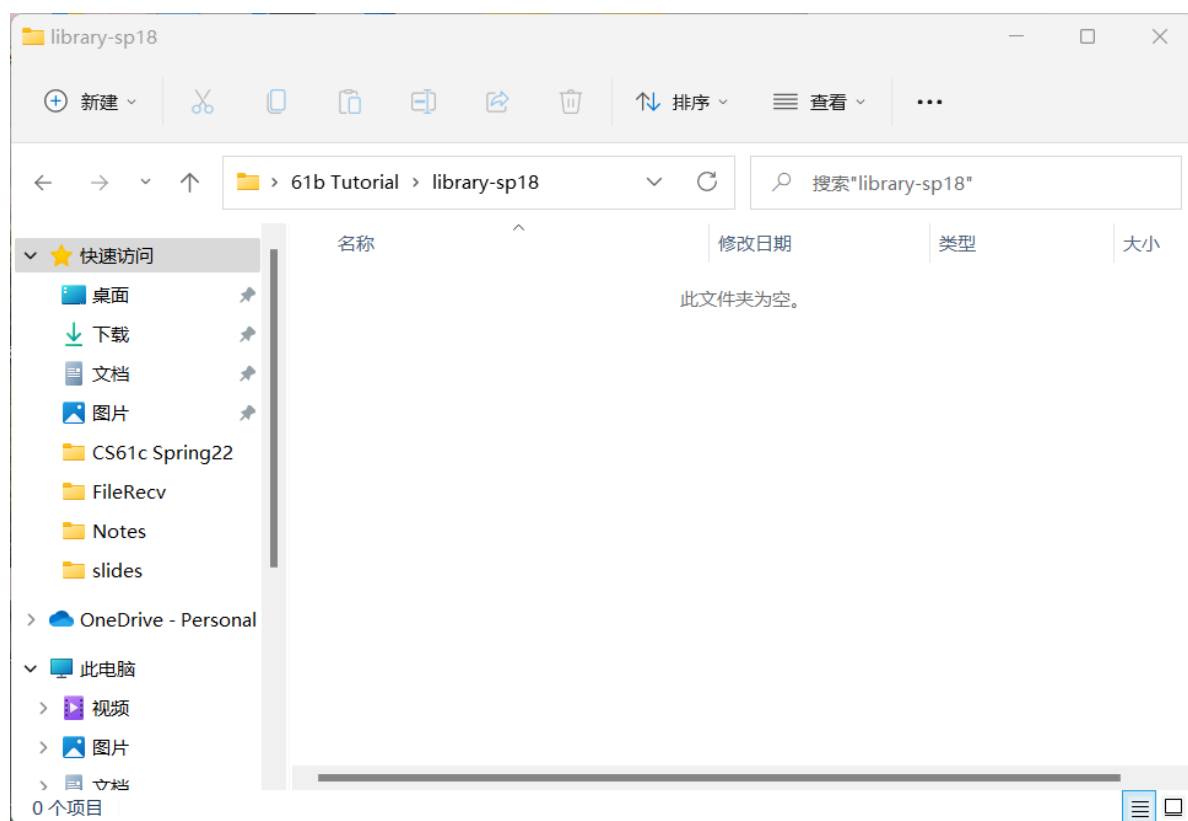
`git push origin master`

这些命令均在上文出现，具体使用效果参见上文提交LeapYear.java的过程

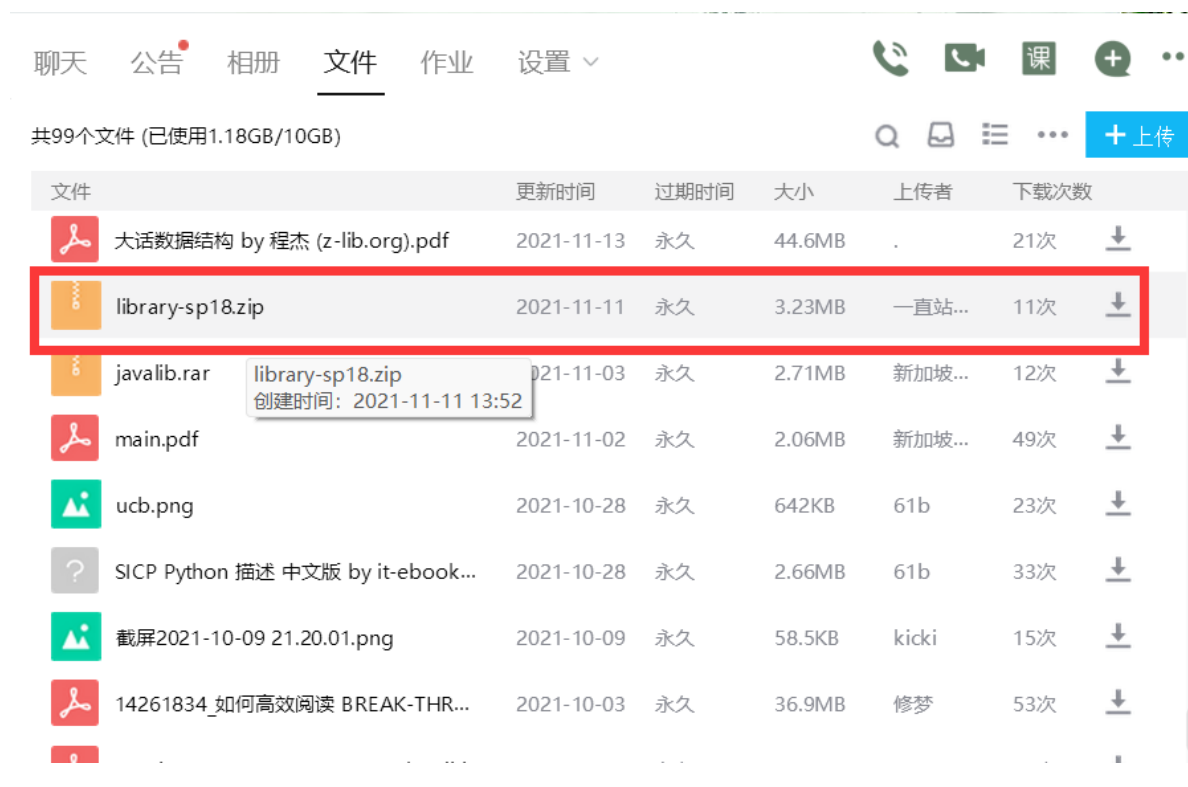
6.关于额外的说明

下载library-sp18

在后面进行Project 0的作业过程中，需要用到**library-sp18**文件夹，进入我们的本地仓库打开发现文件夹为空



在群里下载解压即可



以后如有坑点待补充ing.....