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# Built for developers

GitHub is a development platform inspired by the way you work. From open source to business, you can host and review code, manage projects, and build software alongside 40 million developers.

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Password

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Go to <https://github.com>  
If you have an account, log in. If not, create an account



## Sign in to GitHub

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This is the login view.  
You should now have an account, log in.

The screenshot shows the GitHub homepage with the following visible elements:

- Header:** GitHub logo, search bar ("Search or jump to..."), navigation links (Pull requests, Issues, Marketplace, Explore), notifications, and user profile.
- Left Sidebar (User Profile):**
  - User profile: HeikkiHei
  - Repositories:** alehuo/pyoidc-redis-session-backend (created 6 hours ago), centria/basic-coding, HeikkiHei/coding-homework, centria/coding-exercises, centria/course-template, mluukkai/ohjelmistotekniikka-syksy-2019, HeikkiHei/gradu, materiaalit/tsoha-19. A "Show more" link is present.
  - Your teams:** hydea/hydea, EpicGames/developers
- Activity Feed:** A list of recent repository events:
  - alehuo created a repository [alehuo/pyoidc-redis-session-backend](#) 6 hours ago
  - Walther created a repository [Walther/minipl-rs](#) 8 hours ago
  - vesameskanen pushed to [HSLdevcom/OpenTripPlanner-data-container](#) 11 hours ago
    - 2 commits to [master](#)
    - [40f8793](#) Merge pull request #199 from HSLdevcom/configure-maxslope
    - [1e26eef](#) Increase maximum slope for wheelchair accessible routing as the slope...
  - pre created a repository [rdxnet/k8way](#) yesterday
  - AnttiQ1 pushed to [HSL devcom/digitransit-prov](#) vectorlayer
- Promotional Banners:**
  - "See what launched at GitHub Universe": "Say hello to our new GitHub for mobile experience, get more from GitHub Actions and Packages, and learn how we're shaping the future of software, together."
  - "GitHub Sponsors is out of beta": "We're now generally available in 30 countries, with more coming soon."
  - "Securing software together": "Introducing new ways to identify and prevent security vulnerabilities across your code base."
- Explore repositories:** Links to date-fns/date-fns, aws/aws-cdk, and other popular repositories.

This is the landing page. Here you will see what's happening with your friends and followers. Yours might be a bit emptier for now.

A screenshot of a web browser window showing the GitHub homepage. The user is signed in as 'HeikkiHei'. A dropdown menu is open on the top right, showing options like 'Your profile', 'Your repositories' (which is highlighted in blue), 'Your projects', 'Your stars', 'Your gists', 'Feature preview', 'Help', 'Settings', and 'Sign out'. The main content area shows a list of repositories created by other users:

- alehuo created a repository [alehuo/pyoidc-redis-session-backend](#) 6 hours ago
- Walther created a repository [Walther/minipl-rs](#) 8 hours ago
- vesameskanen pushed to [HSLdevcom/OpenTripPlanner-data-container](#) 11 hours ago
- pre created a repository [rdxnet/k8way](#) yesterday
- Antiik91 pushed to [HSLdevcom/digitransit-proxy](#) yesterday

The URL in the address bar is <https://github.com/HeikkiHei?tab=repositories>.

Open the menu on the top right and click the link "Your repositories".

The screenshot shows a GitHub profile page for a user named Heikki Hei. The profile picture is a photo of a man with a beard. The page includes sections for Overview, Repositories (31), Projects (0), Packages (0), Stars (1), Followers (23), and Following (40). There is a search bar and filters for Type: All and Language: All. Below the header, there are five repository cards:

- coding-homework**: C# repository updated 6 hours ago.
- fullstack**: Full Stack React course for Univ Helsinki CS repository updated 20 days ago.
- gradu**: Private TeX repository updated 29 days ago.
- ohjelmistotekniikka-syksy-2019**: Forked from mluukkai/ohjelmistotekniikka-syksy-2019 repository updated on 19 Oct 2019.
- klaustrofobia**: Private Java repository updated 18 days ago.

Here is your "home page". This will show your basic information for you. Other people can also see this, or all the public parts, at least.

The screenshot shows a browser window with several tabs open. The active tab is for a GitHub profile named 'Heikki Hei'. The profile page displays a large photo of a man with a beard, a list of repositories (including 'coding-homework', 'fullstack', 'gradu', 'ohjelmistotekniikka-syksy-2019', and 'klaustrofobia'), and various user statistics like 31 repositories and 23 followers.

GitHub profile of Heikki Hei:

- coding-homework**: C# (Updated 6 hours ago)
- fullstack**: Full Stack React course for Univ Helsinki CS (HTML, Updated 20 days ago)
- gradu**: Private (TeX, Updated 29 days ago)
- ohjelmistotekniikka-syksy-2019**: Forked from mluukkai/ohjelmistotekniikka-syksy-2019 (Java, 18 stars, Other, Updated on 19 Oct 2019)
- klaustrofobia**: Private

At the top of the GitHub page, there is a green button labeled "New".

Let's create a new repository.  
Click the green button on the top right, that says "New".

**Create a new repository**

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

---

**Repository template**  
Start your repository with a template repository's contents.

---

Owner      Repository name \*

 HeikkiHei ▾ / basic-coding ✓

Great repository names are short and memorable. Need inspiration? How about [fantastic-barnacle](#)?

Description (optional)

---

 **Public**  
Anyone can see this repository. You choose who can commit.

 **Private**  
You choose who can see and commit to this repository.

---

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

**Initialize this repository with a README**  
This will let you immediately clone the repository to your computer.

|  ⓘ

---

A window like this opens. Give your repository a good name, that tells what it is. Mine is now "basic-coding".  
Leave it public so I (and others) can access it, as well.  
Do not touch other settings.  
Click "Create repository" button, the green one on the bottom.

The screenshot shows a browser window with several tabs open at the top. The active tab is 'HeikkiHei/basic-coding' on GitHub. The page content is as follows:

- Quick setup — if you've done this kind of thing before**
  - Set up in Desktop** or **HTTPS** <https://github.com/HeikkiHei/basic-coding.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 "# basic-coding" >> README.md
git init
git add README.md
git commit -m "first commit"
git remote add origin https://github.com/HeikkiHei/basic-coding.git
git push -u origin master
```
- ...or push an existing repository from the command line**

```
git remote add origin https://github.com/HeikkiHei/basic-coding.git
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](#)

Now you have a repository. It is still empty, but let's change that.  
I have highlighted the line you want to save for later.

No description, website, or topics provided.

Manage topics

30 commits 1 branch 0 packages 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

HeikkiHei Prints and variables done  
part1 Prints and variables done  
.gitignore Update gitignore  
README.md Prints and variables done

Clone with HTTPS Use SSH  
https://github.com/centria/coding-exercises

Open in Desktop Download ZIP

## Exercises

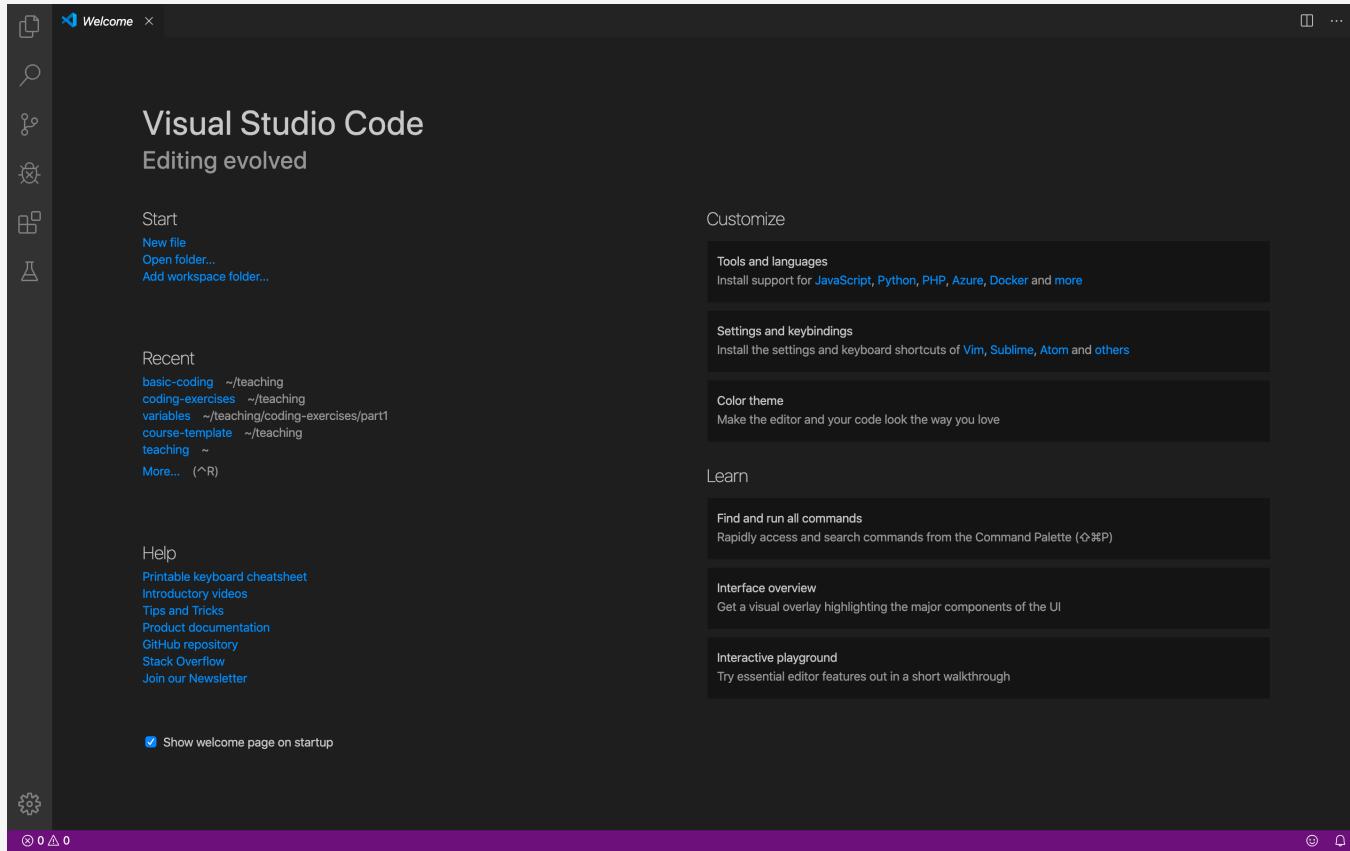
### Part 1

#### Printing and reading

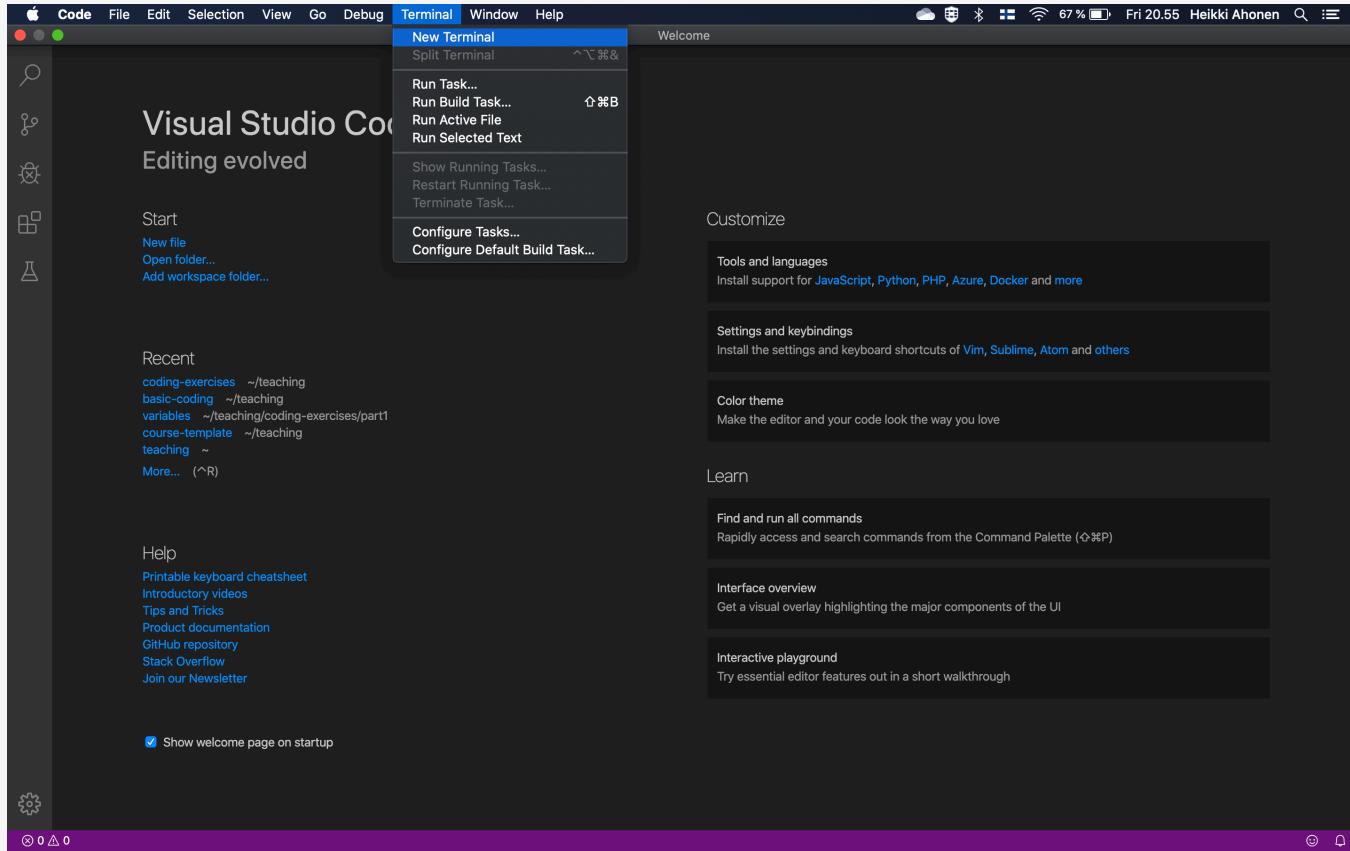
The basic structure of the program is given in the exercises:

```
using System;
```

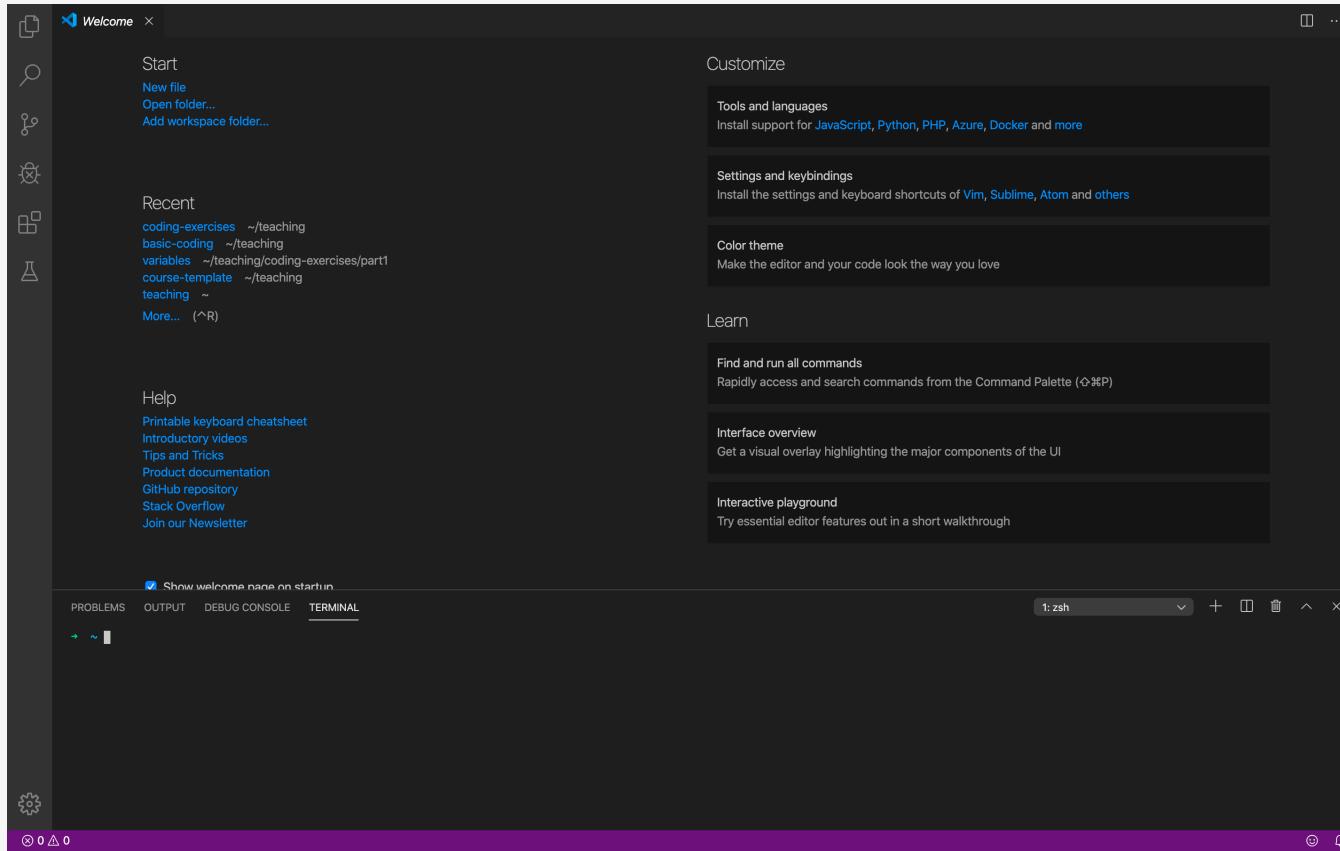
Go to <https://github.com/centria/coding-exercises> in your browser  
Click the green button, "Clone or download"  
Copy the link <https://github.com/centria/coding-exercises.git>



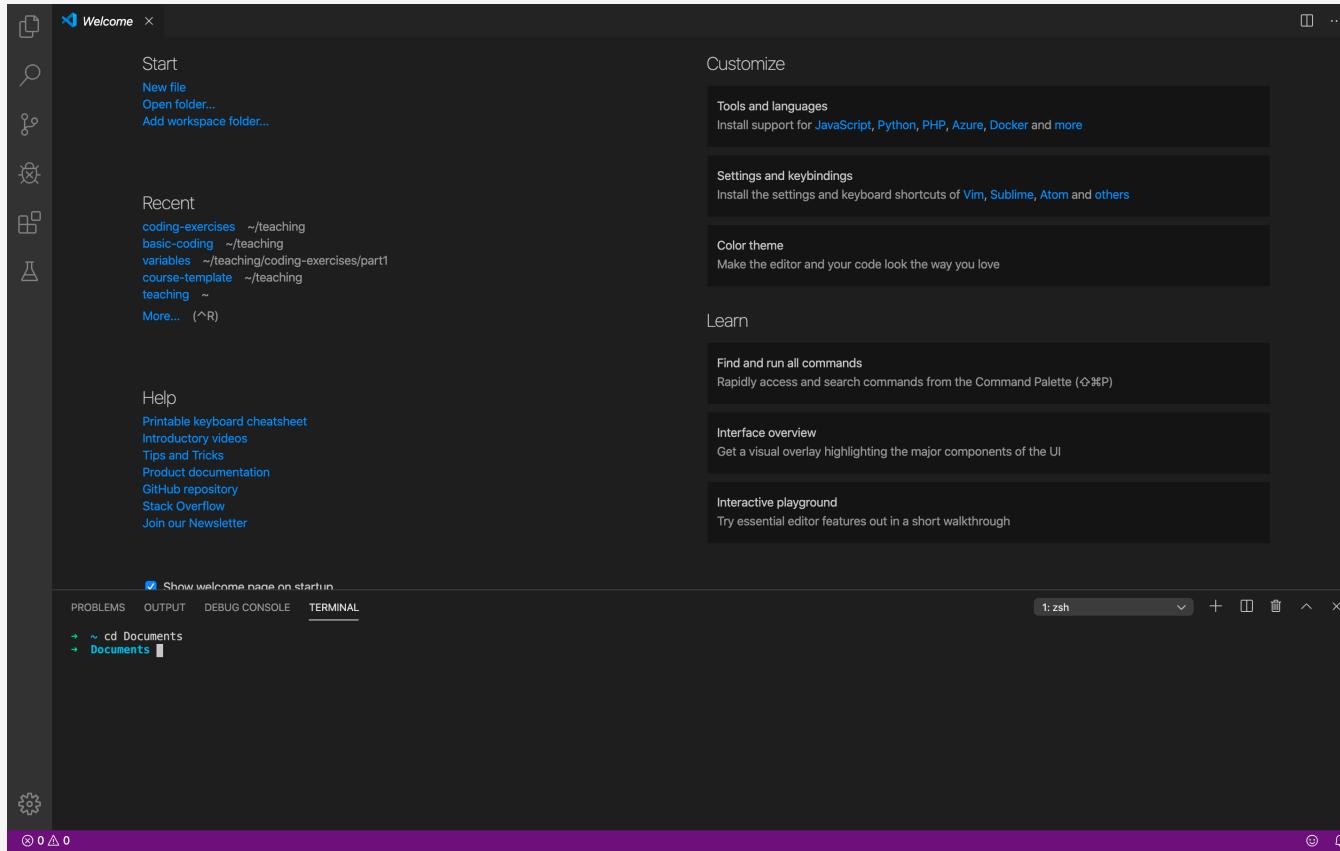
**Open Visual Studio Code**  
Yours might look a bit different, as I do not have Windows.  
The functionality is still exactly the same.



In the menu, go to Terminal > New terminal



You can see, a terminal opens.  
It looks a bit different, as it is not Windows.  
With our Git Bash installed, it works in the same way still.



In the terminal, write  
cd Documents  
This will open the Documents folder, just like in the classroom.

```
→ ~ cd Documents
→ Documents git clone https://github.com/centria/coding-exercises.git
Cloning into 'coding-exercises'...
remote: Enumerating objects: 368, done.
remote: Counting objects: 100% (368/368), done.
remote: Compressing objects: 100% (198/198), done.
remote: Total 368 (delta 184), reused 323 (delta 139), pack-reused 0
Receiving objects: 100% (368/368), 4.92 MiB | 1.17 MiB/s, done.
Resolving deltas: 100% (184/184), done.
→ Documents █
```

In the Documents folder, write  
git clone https://github.com/centria/coding-exercises.git  
This will clone the school's repository to your computer

```
→ Documents cd coding-exercises/█
```

Now write

cd <your-repository>.

For me, that is "cd coding-exercises", as in page 8 I gave that as the name

```
→ Documents cd coding-exercises
→ coding-exercises git:(master) git remote add origin https://github.com/HeikkiHei/basic-coding.git
fatal: remote origin already exists.
→ coding-exercises git:(master)
```

Now I try to add my own new repository that we created.  
The line we use is the one we saved in page 9.  
We get an error, as the name "origin" is already in use for the school repository.  
Let's change our repository's nickname and try again.

```
→ Documents cd coding-exercises
→ coding-exercises git:(master) git remote add origin https://github.com/HeikkiHei/basic-coding.git
fatal: remote origin already exists.
→ coding-exercises git:(master) git remote add homework https://github.com/HeikkiHei/basic-coding.git
```

```
→ coding-exercises git:(master) git remote -v
homework      https://github.com/HeikkiHei/basic-coding.git (fetch)
homework      https://github.com/HeikkiHei/basic-coding.git (push)
origin        https://github.com/centria/coding-exercises.git (fetch)
origin        https://github.com/centria/coding-exercises.git (push)
→ coding-exercises git:(master) █
```

I have changed it now to "homework".

We can check if it works with a command:

git remote -v

We now see that we have:

- homework for our own repository
- origin for the school repository

We want to keep both

 73% Fri 20.22 Heikki Ahonen

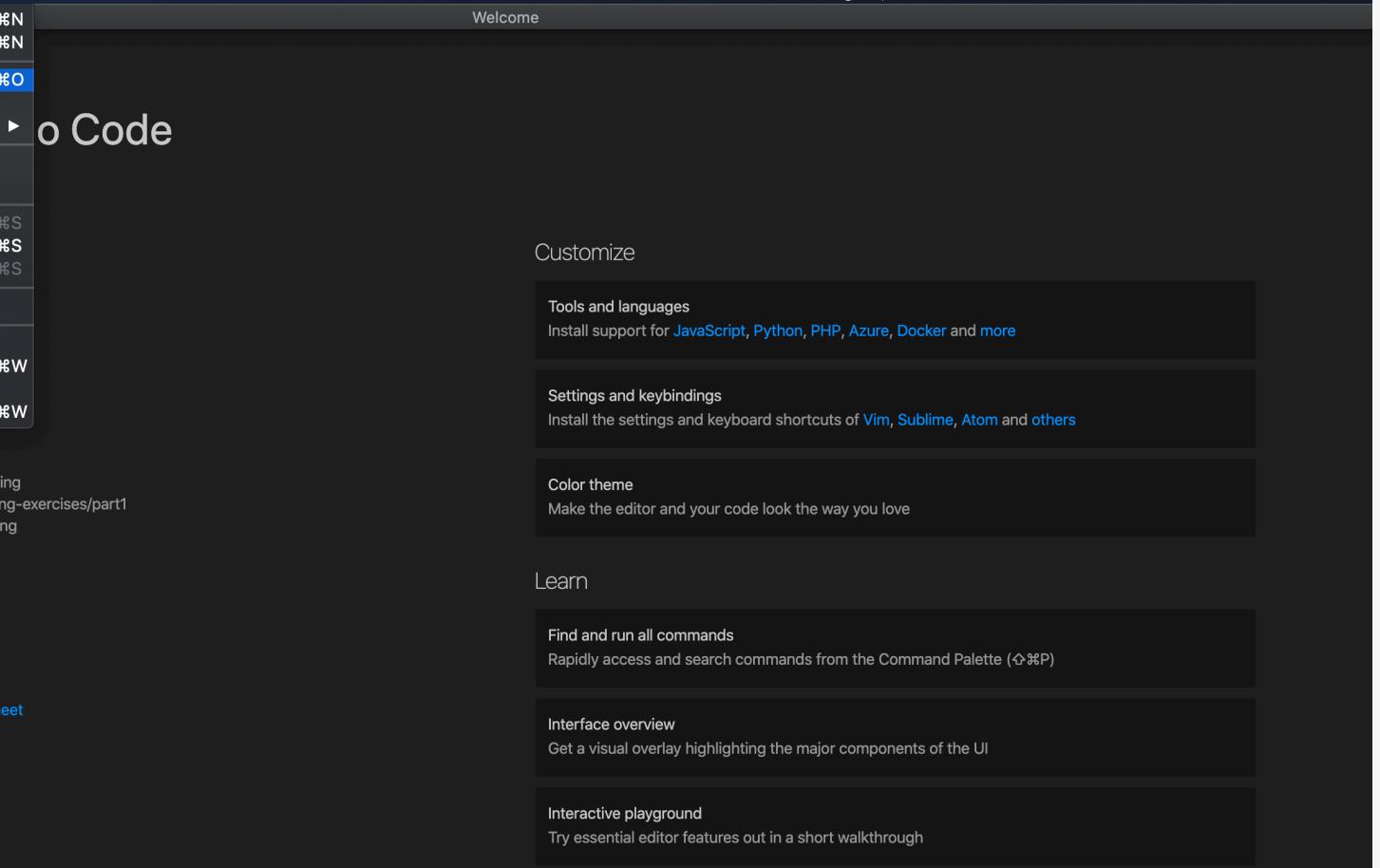
**Code**

**File** Edit Selection View Go Debug Terminal Window Help

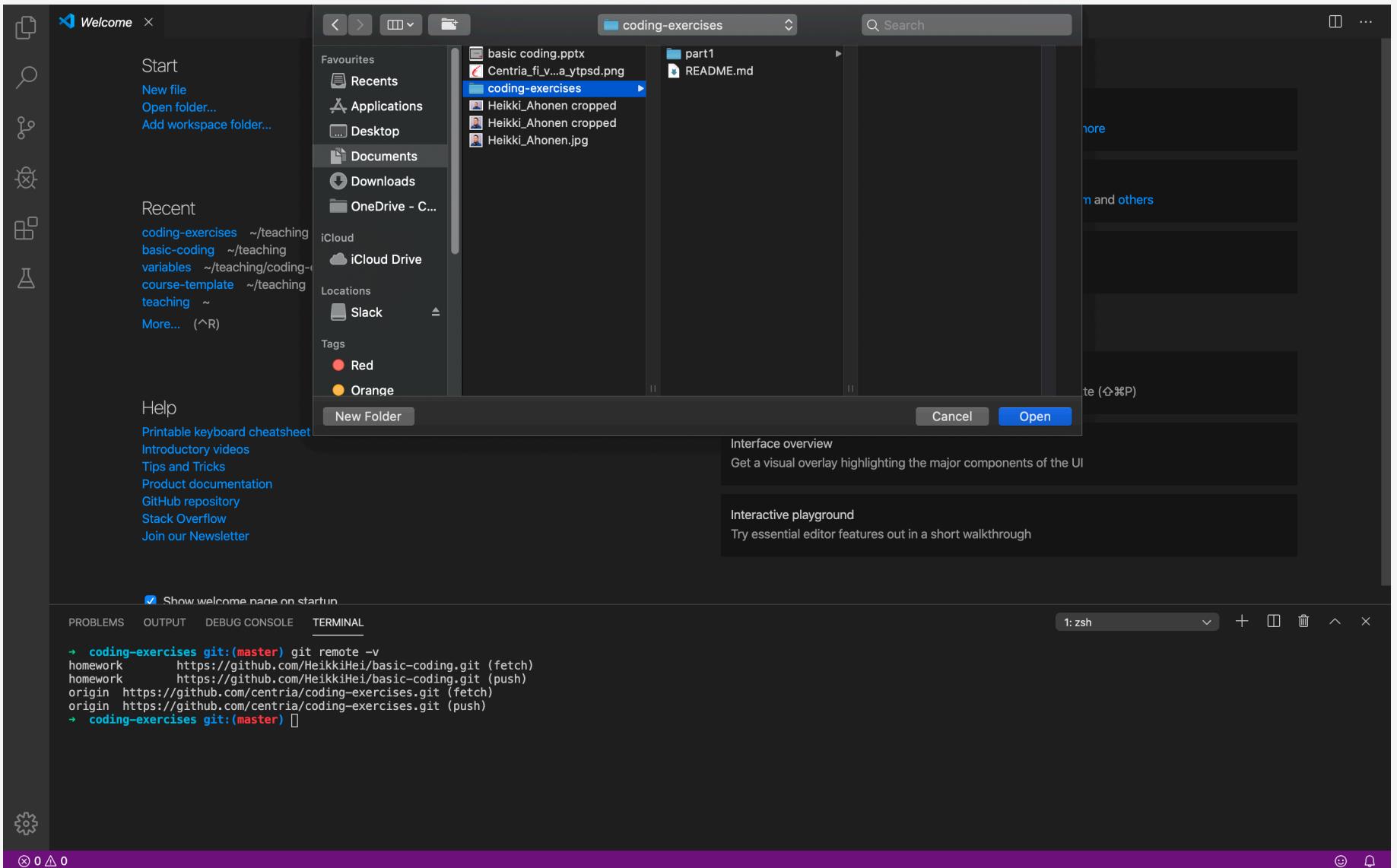
New File ⌘N  
New Window ⌘⌘N  
**Open...** ⌘O  
Open Workspace...  
Open Recent ►  
Add Folder to Workspace...  
Save Workspace As...  
  
Save ⌘S  
Save As... ⌘⌘S  
Save All ⌘⌘⌘S  
  
Auto Save  
  
Revert File  
Close Editor ⌘W  
Close Folder [⌘K F]  
Close Window ⌘W  
  
RECENT  
basic-coding ~/teaching  
coding-exercises ~/teaching  
variables ~/teaching/coding-exercises/part1  
course-template ~/teaching  
teaching ~  
More... (^R)

**Help**  
Printable keyboard cheatsheet  
Introductory videos  
Tips and Tricks  
Product documentation  
GitHub repository  
Stack Overflow  
Join our Newsletter

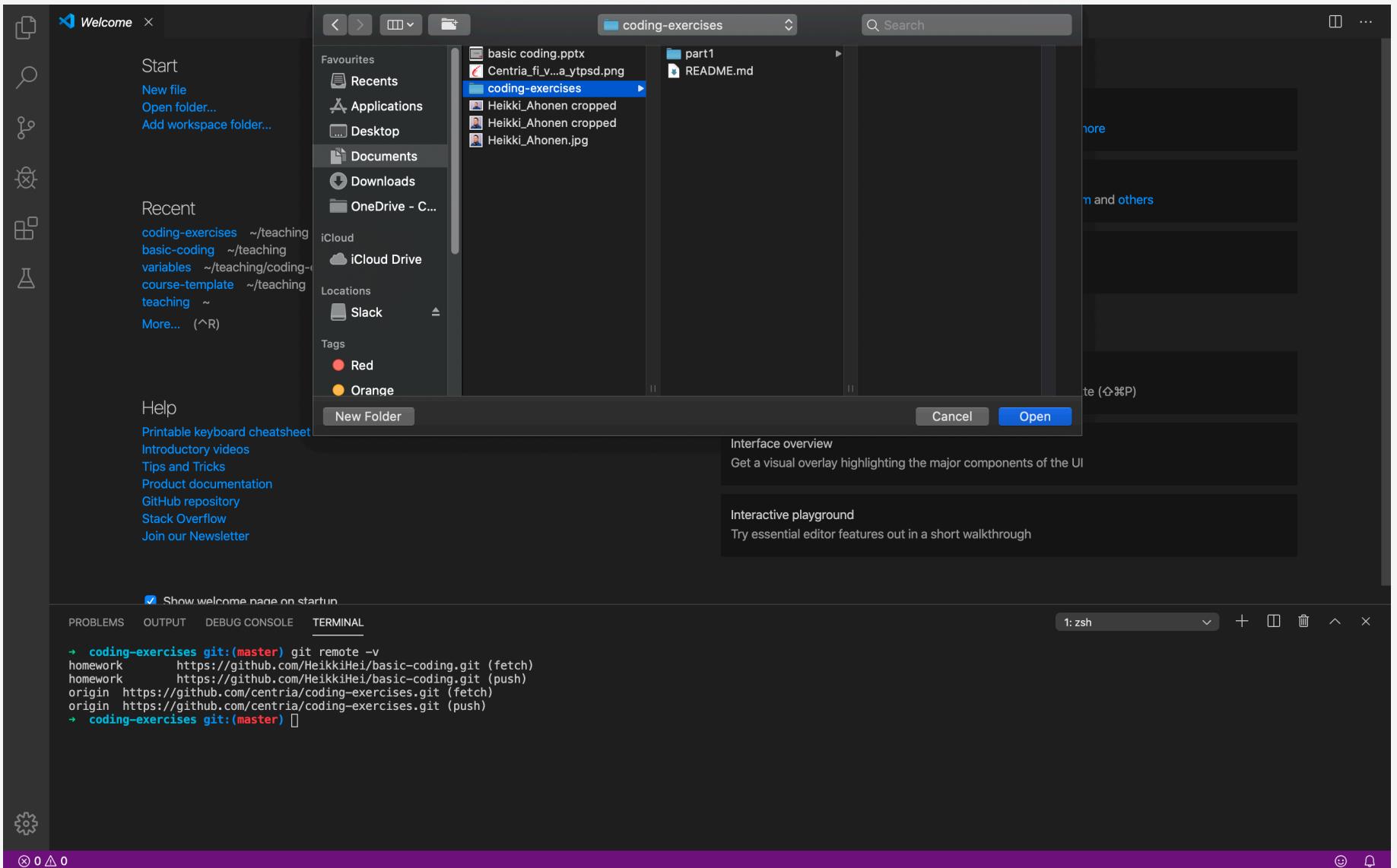
Show welcome page on startup



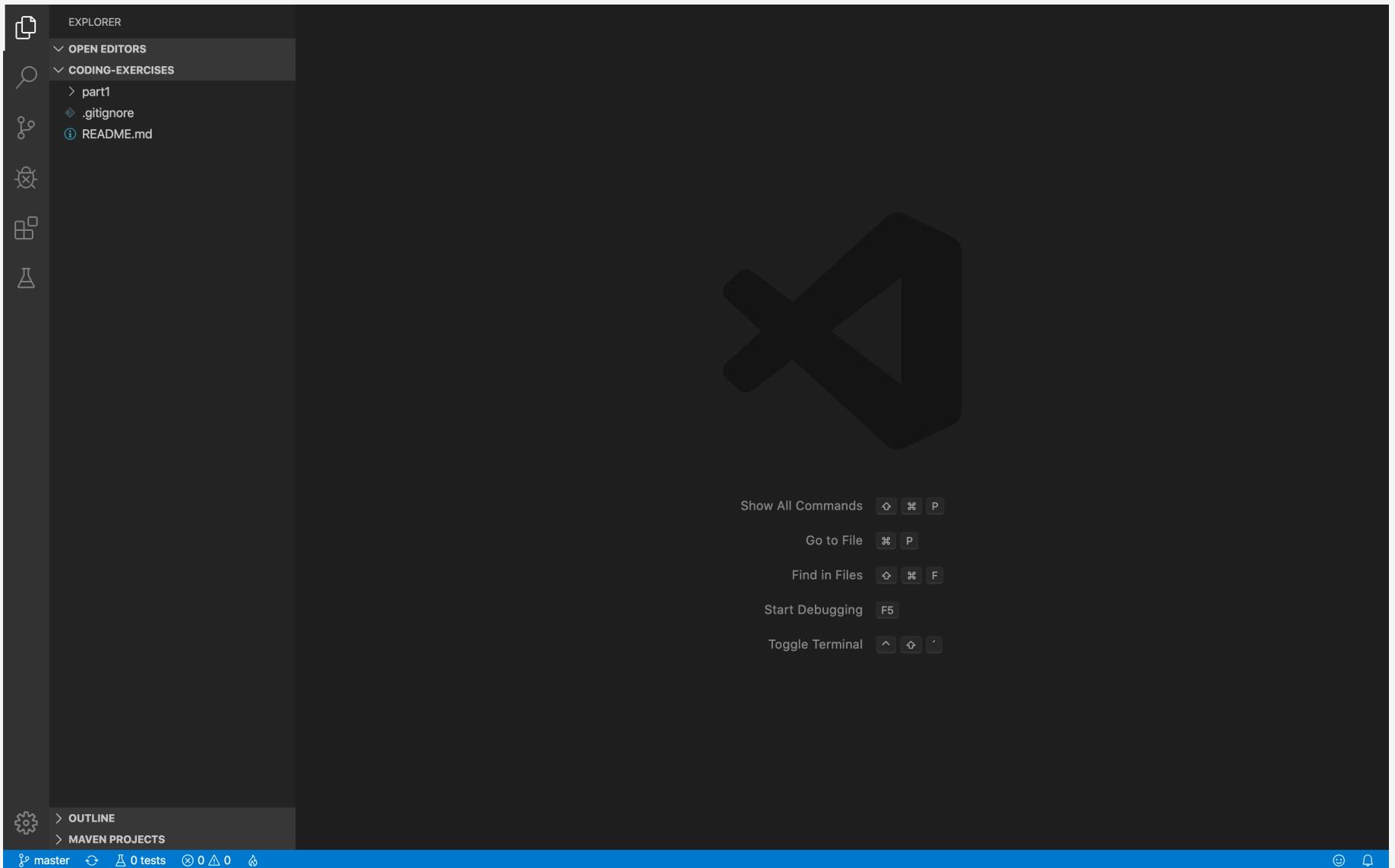
If you use Windows, go to File > Open folder.  
I use a Mac, so I have the option of "Open.."



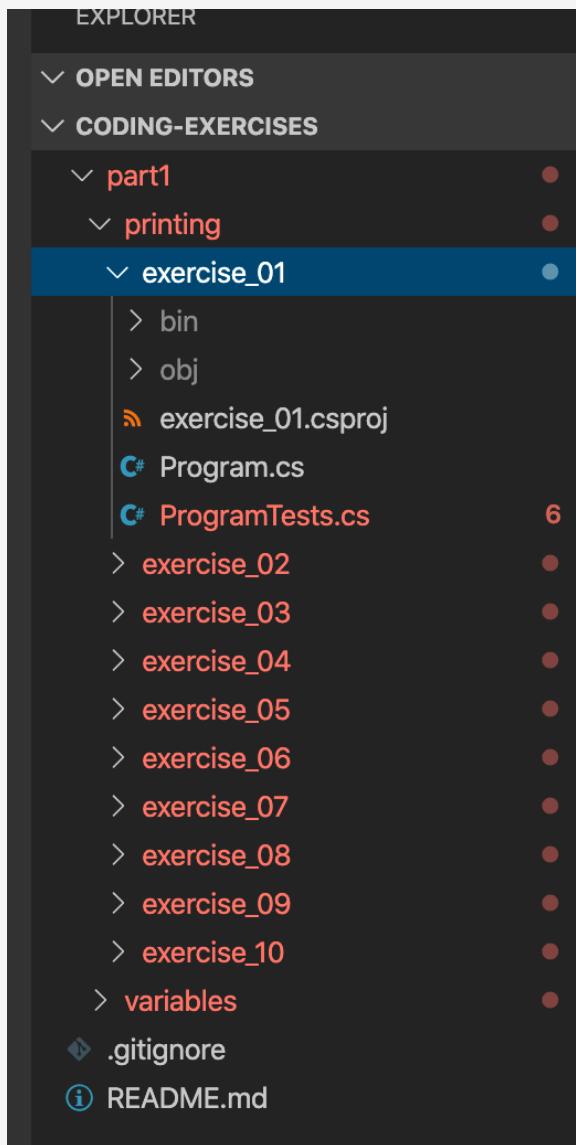
Open your repository folder by finding it from the Documents folder, where we cloned it earlier. Once again, Mac and Windows might look different.



Open your repository folder by finding it from the Documents folder, where we cloned it earlier. Once again, Mac and Windows might look different.



A view similar to this should open.  
Click on the folder: part 1 > printing > exercise\_01



You should now see the exercises. They might be red like a fire truck.  
That is just fine.  
Open the Program.cs by clicking it.

The screenshot shows the Microsoft Visual Studio Code interface. The Explorer sidebar on the left lists project files under 'CODING-EXERCISES' (part1, printing, exercise\_01, etc.). The Editor tab at the top has 'Program.cs' selected. The code editor displays the following C# code:

```
part1 > printing > exercise_01 > Program.cs > ...
1  using System;
2  ...
3  namespace exercise_01
4  {
5      ...
6      class Program
7      {
8          ...
9          public static void Main(string[] args)
10         {
11             ...
12         }
13     }
14 }
```

The status bar at the bottom shows: master, 0 tests, 121 ▲ 1, coding-exercises, Ln 1, Col 1, Spaces: 4, UTF-8 with BOM, CRLF, C#, and a bell icon.

Now we have our exercise open.

Let's do the exercise (the instructions are in the repository).

EXPLORER

OPEN EDITORS

CODING-EXERCISES

part1 > printing > exercise\_01 > Program.cs > {} exercise\_01 > exercise\_01.Program > Main(string[] args)

```
1  using System;
2
3  namespace exercise_01
4  {
5      class Program
6      {
7          public static void Main(string[] args)
8          {
9              // Add your code here:
10             Console.WriteLine("Hello World");
11         }
12     }
13 }
14 }
```

gitignore

README.md

OUTLINE

MAVEN PROJECTS

master\* 0 tests 121 ▲ 1 coding-exercises

Ln 10, Col 46 Spaces: 4 UTF-8 with BOM CRLF C# 1

Done.

Open a new terminal.

A screenshot of the Visual Studio Code (VS Code) interface. The top bar shows the application name "Code" and various menu options: File, Edit, Selection, View, Go, Debug, Terminal, Window, Help. The status bar at the bottom displays the current file path "ram.cs — coding-exercises", the line and column number "Ln 10, Col 46", the character encoding "UTF-8 with BOM", and the file type "C#".

The left sidebar contains the "OPEN EDITORS" section with "Program.cs" and "ProgramTests.cs" listed. Below it is the "CODING-EXERCISES" section, which includes "part1", "printing", "exercise\_01", "exercise\_02", "exercise\_03", "exercise\_04", "exercise\_05", "exercise\_06", "exercise\_07", "exercise\_08", "exercise\_09", "exercise\_10", "variables", ".gitignore", and "README.md".

The main editor area shows a C# code snippet:

```
part1 > printing
1  using
2  namespaces;
3  {
4  }
5  {
6  }
7  {
8  }
9  {
10 }
11 }
12 }
13 }
14 }
```

A context menu is open over the code, with the top item being "New Terminal". Other visible items in the menu include "Split Terminal", "Run Task...", "Run Build Task...", "Run Active File", "Run Selected Text", "Show Running Tasks...", "Restart Running Task...", "Terminate Task...", "Configure Tasks...", and "Configure Default Build Task...".

Just a recap, you can open a new terminal from Terminal > New terminal.

PROBLEMS 122

OUTPUT

DEBUG CONSOLE

TERMINAL

```
→ coding-exercises git:(master) ✘ cd part1/printing/exercise_01
```

In the terminal, go to the folder where the exercise you are doing is.  
For me, it looks like this.

PROBLEMS 122

OUTPUT

DEBUG CONSOLE

TERMINAL

```
→ coding-exercises git:(master) ✘ cd part1/printing/exercise_01
```

In the terminal, go to the folder where the exercise you are doing is.  
For me, it looks like this.

```
→ exercise_01 git:(master) ✘ dotnet run  
Hello World  
→ exercise_01 git:(master) ✘ dotnet test
```

You can try your solution with "dotnet run".  
To run the test and see if it passes, run "dotnet test"

```
A total of 1 test files matched the specified pattern.  
X TestExercise01 [31ms]  
Error Message:  
    Check your code! The test requires exact match!  
Expected string length 13 but was 12. Strings differ at index 11.  
Expected: "Hello World!\n"  
But was:  "Hello World\n"  
-----^
```

I had an error. I am missing a ! from the end.  
I will fix it, save the file, and run "dotnet test" again.

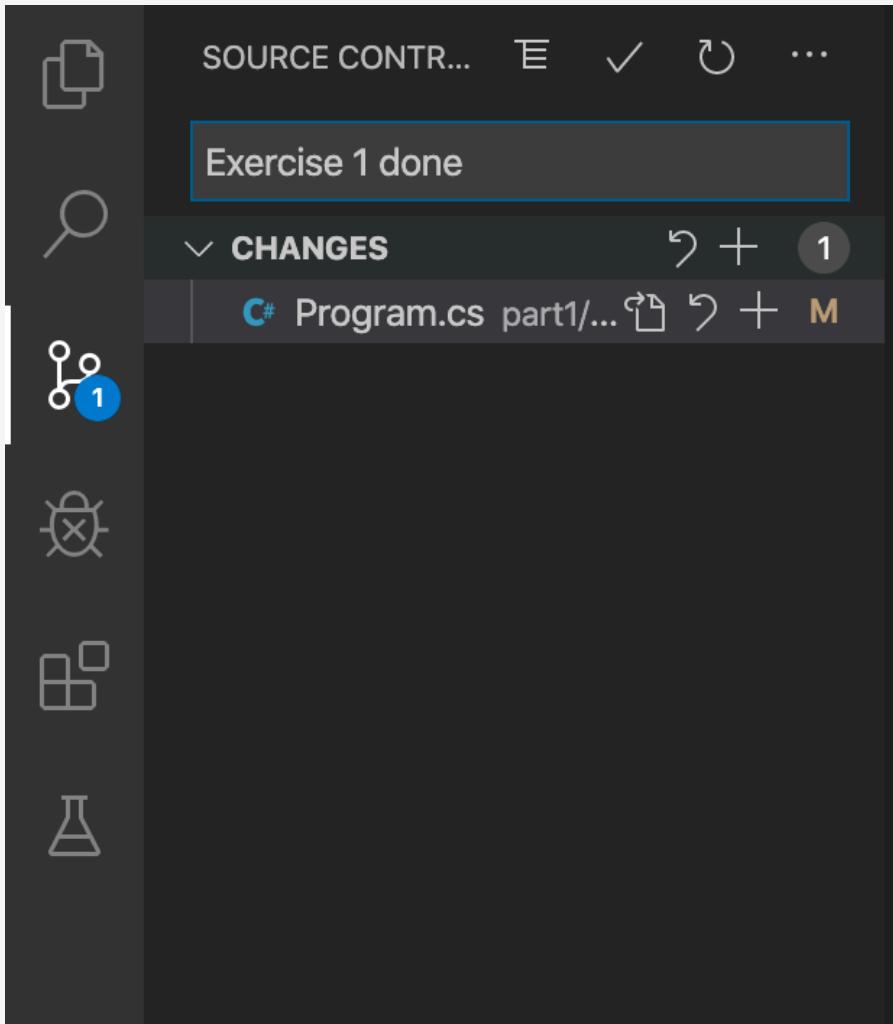
```
→ exercise_01 git:(master) ✘ dotnet test
Test run for /Users/heikkiahonen/Documents/coding-exercises/pa
)
Microsoft (R) Test Execution Command Line Tool Version 16.3.0
Copyright (c) Microsoft Corporation. All rights reserved.

Starting test execution, please wait...

A total of 1 test files matched the specified pattern.

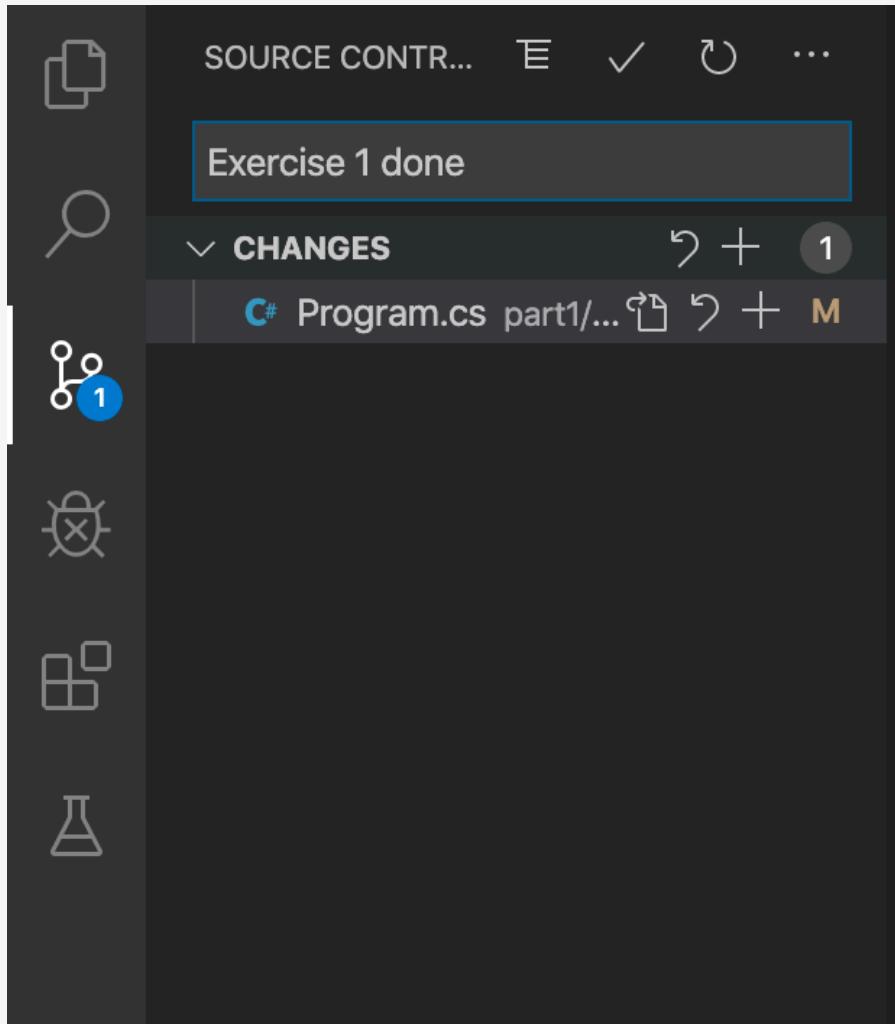
Test Run Successful.
Total tests: 1
    Passed: 1
    Total time: 0.6515 Seconds
→ exercise_01 git:(master) ✘
```

It passed. I can now return my exercise.



On the left menu you can see the version control item (highlighted and has a blue circle). Click that, and it will open.

You can see all the files with changes in them, now only our Program.cs for exercise\_01



Give a meaningful commit message. For me, it is "Exercise 1 done" this time.  
Click on the commit-icon at the top (the ✓ mark).

The screenshot shows the Visual Studio Code interface. In the center, a modal dialog box is displayed with the message: "There are no staged changes to commit. Would you like to automatically stage all your changes and commit them directly?". It includes four buttons: "Never", "Always", "Cancel", and "Yes". Below the dialog, the code editor shows a C# file named "Program.cs" with the following content:

```
1 using System;
2
3 namespace exercise_01
4 {
5     class Program
6     {
7         public static void Main(string[] args)
8         {
9             // Add your code here:
10            Console.WriteLine("Hello World!");
11        }
12    }
13}
14
```

At the bottom of the screen, the terminal window displays the output of a "dotnet test" command:

```
+ exercise_01 git:(master) ✘ dotnet test
Test run for /Users/heikkiahonen/Documents/coding-exercises/part1/printing/exercise_01/bin/Debug/netcoreapp3.1/exercise_01.dll(.NETCoreApp,Version=v3.1)
Microsoft (R) Test Execution Command Line Tool Version 16.3.0
Copyright (c) Microsoft Corporation. All rights reserved.

Starting test execution, please wait...
A total of 1 test files matched the specified pattern.

Test Run Successful.
Total tests: 1
  Passed: 1
  Total time: 0.6515 Seconds
+ exercise_01 git:(master) ✘
```

You might get an error "There are no staged changes to commit".

This means that we have not added the files manually, that we want to send.

Click "Yes" to send the files to repository.

SOURCE CONTR... ✓ ⌂ ... Program.cs x

Message (⌘Enter to commit on 'm')

CHANGES

Pull  
Pull (Rebase)  
Pull from...  
Push  
Push to...  
Sync  
Checkout to...  
Publish Branch...

Commit All  
Commit All (Amend)  
Commit All (Signed Off)  
Commit Staged  
Commit Staged (Amend)  
Commit Staged (Signed Off)  
Undo Last Commit

Discard All Changes  
Stage All Changes  
Unstage All Changes

Apply Latest Stash  
Apply Stash...  
Drop Stash...  
Pop Latest Stash  
Pop Stash...  
Stash  
Stash (Include Untracked)

Show Git Output

PROBLEMS 16 OUTPUT DEBUG CONSOLE TERMINAL

1: zsh

```
+ exercise_01 git:(master) ✘ dotnet test
Test run for /Users/heikkiahoonen/Documents/coding-exercises/part1/printing/exercise_01/bin/Debug/netcoreapp3.1/exercise_01.dll(.NETCoreApp,Version=v3.1)
Microsoft (R) Test Execution Command Line Tool Version 16.3.0
Copyright (c) Microsoft Corporation. All rights reserved.

Starting test execution, please wait...

A total of 1 test files matched the specified pattern.

Test Run Successful.
Total tests: 1
    Passed: 1
    Total time: 0.6515 Seconds
+ exercise_01 git:(master) ✘
```

master 0 0 115 1 coding-exercises

Ln 10, Col 44 Spaces: 4 UTF-8 with BOM CRLF C# ⌂ 1

From the menu “...” select “Push to...” and from there select “homework.” If you are doing this for the first time, the program will ask for your username and password for GitHub.

The screenshot shows a browser window with several tabs open. The active tab is for the GitHub repository 'HeikkiHei/basic-coding'. The repository page displays basic statistics: 31 commits, 1 branch, 0 packages, 0 releases, and 1 contributor. A list of recent commits is shown, including 'Ex 1 done' by 'HeikkiHei' (1 minute ago), 'part1' (1 minute ago), 'Update gitignore' (2 days ago), and 'Prints and variables done' (21 hours ago). Below the commit history is a rich-text editor interface for editing the 'README.md' file. The editor contains sections for 'Exercises', 'Part 1', and 'Printing and reading', with a note about the basic program structure.

No description, website, or topics provided.

Manage topics

31 commits 1 branch 0 packages 0 releases 1 contributor

Branch: master ▾ New pull request Create new file Upload files Find file Clone or download

HeikkiHei Ex 1 done Latest commit ecc2327 1 minute ago

part1 Ex 1 done 1 minute ago

.gitignore Update gitignore 2 days ago

README.md Prints and variables done 21 hours ago

README.md

## Exercises

### Part 1

#### Printing and reading

The basic structure of the program is given in the exercises:

Now if we go to our repository, we can see there is something in there.

Let's open the folders:

part1 > printing > exercise\_01

A screenshot of a web browser showing multiple tabs open. The active tab is a GitHub repository for 'HeikkiHei/basic-coding' containing the 'exercise\_01' folder. The repository has 1 star, 0 forks, and 0 issues. The commit history shows several changes made by 'HeikkiHei' to files like 'Program.cs' and 'exercise\_01.csproj'. The GitHub footer includes links to Contact GitHub, Pricing, API, Training, Blog, and About.

Introduction - basic-coding | Osa 2 - Ohjelmoinnin MOOC 20 | centria/coding-exercises | devTalk goes Jeppis | Meetup | basic-coding/part1/printing/exer

github.com/HeikkiHei/basic-coding/tree/master/part1/printing/exercise\_01

Pull requests Issues Marketplace Explore

Unwatch 1 Star 0 Fork 0

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

Branch: master basic-coding / part1 / printing / exercise\_01 /

Create new file Upload files Find file History

HeikkiHei Ex 1 done Latest commit ecc2327 2 minutes ago

..

Program.cs Ex 1 done 2 minutes ago

Program.cs Fix EOL yesterday

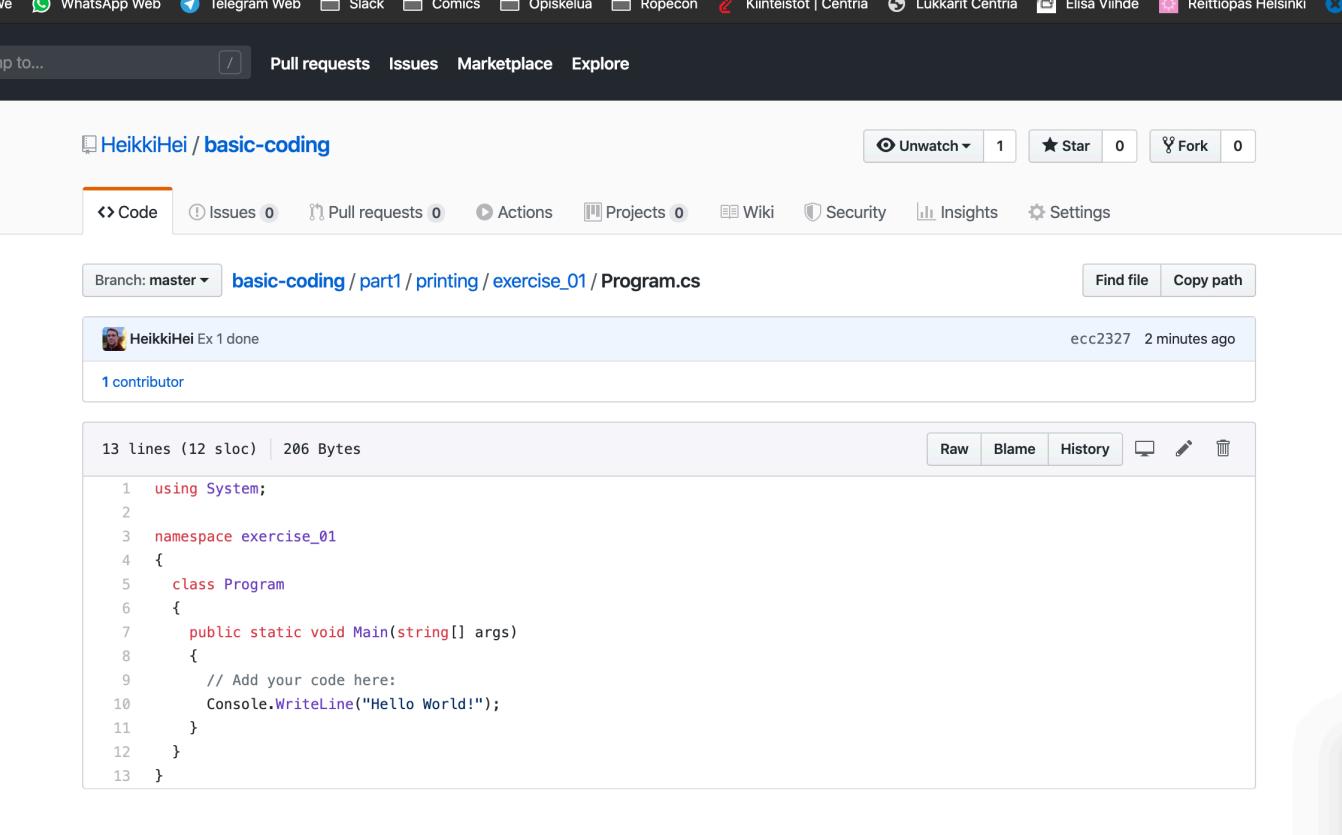
exercise\_01.csproj Redo structure yesterday

© 2020 GitHub, Inc. Terms Privacy Security Status Help

Contact GitHub Pricing API Training Blog About

[https://github.com/HeikkiHei/basic-coding/blob/master/part1/printing/exercise\\_01/Program.cs](https://github.com/HeikkiHei/basic-coding/blob/master/part1/printing/exercise_01/Program.cs)

Open your file Program.cs in the folder



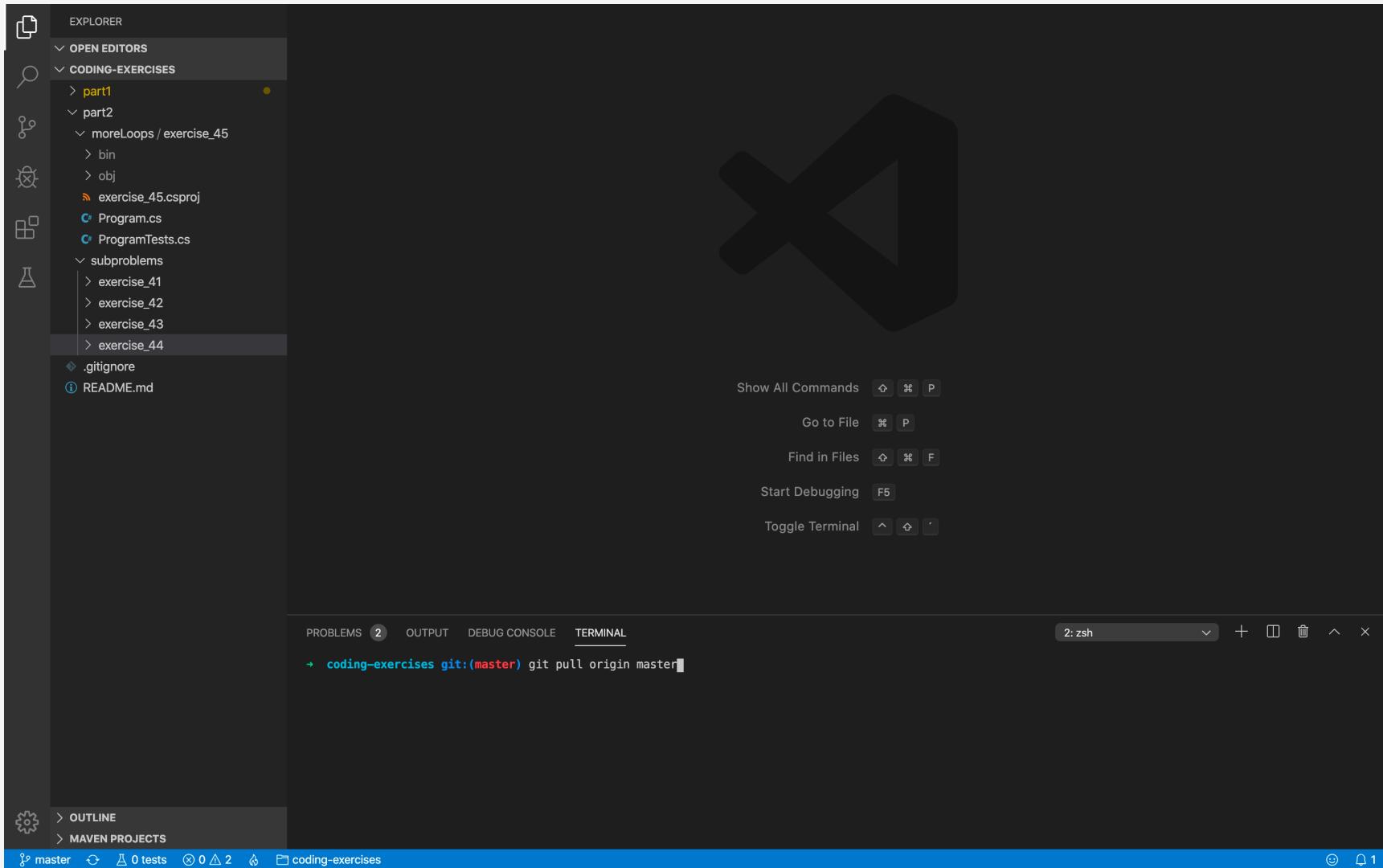
The screenshot shows a browser window with multiple tabs open, including "Introduction - basic-coding", "Osa 2 - Ohjelmointin MOOC 201", "centria/coding-exercises", "devTalk goes Jeppis | Meetup", and "basic-coding/Program.cs at master". The main content is a GitHub repository page for "HeikkiHei/basic-coding". The repository has 1 star and 0 forks. The "Code" tab is selected, showing the file "Program.cs" under the "basic-coding/part1/printing/exercise\_01" branch. The file contains 13 lines of C# code:

```
1 using System;
2
3 namespace exercise_01
4 {
5     class Program
6     {
7         public static void Main(string[] args)
8         {
9             // Add your code here:
10            Console.WriteLine("Hello World!");
11        }
12    }
13 }
```

Now you see your code in the repository. You have submitted your first exercise!  
To do other exercises, just...

- open another folder (for example exercise\_02)
  - Do the exercise
  - Follow these instructions to submit them!





There are new exercises from time to time. To update your local repository to include the new exercises, use the command "git pull origin master".

This should give you the new files, but not override your done solutions.

The screenshot shows the Visual Studio Code interface. The left sidebar displays the file structure under the 'EXPLORER' tab, including 'OPEN EDITORS', 'CODING-EXERCISES' (with 'part1' and 'part2' expanded), and files like 'Program.cs', 'ProgramTests.cs', and 'exercise\_44'. The bottom left also shows 'OUTLINE' and 'MAVEN PROJECTS'. The main area features a large 'X' logo. The 'TERMINAL' tab is active, showing a terminal session:

```
+ coding-exercises git:(master) git pull origin master
From github.com:centria/coding-exercises
 * branch      master    -> FETCH_HEAD
Already up to date.
+ coding-exercises git:(master)
```

The status bar at the bottom indicates the current branch is 'master'.

If you get the message "Already up to date", there are no updates yet to be had.