

# T04: Adventures in Gitland

- Recall our discussion on Day 1 about how to work well with your partner.
- Pair programming involves two roles: the driver (who types the code) and the navigator (who reads the instructions).
- If you run into an issue, then work with your partner to solve it.
- If both you and your partner have the same issue, then summon a teaching assistant or instructor.

## Learning Objectives

- Refactor existing code into functions.
- Get additional practice with nesting conditionals.
- Learn to use git to collaborate.

## How to Start

- To begin, make a copy of this document by going to File >> Make a Copy...
- Share the copied document with all members of your team. You can share this document by hitting the blue button in the top right of the document, then entering the email addresses of all members in the bottom input field.
- Change the file name of this document to **username1, username2 - T04: Adventures in Gitland** (for example, **pearcej, heggens - T04: Adventures in Gitland**). To do this, click the label in the top left corner of your browser.
- We will **not** be using GitHub Classroom for this assignment. Instead, use PyCharm to clone the code from [the T04 master repository](https://github.com/Berea-College-CSC-226/t04-main). **Don't start editing code until we instruct you to do so!**
- First, discuss with your team and assign yourselves roles.

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| Github Repo Link: | <a href="https://github.com/Berea-College-CSC-226/t04-main">https://github.com/Berea-College-CSC-226/t04-main</a> |
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First, discuss and assign roles. *Try to pick the role you've had the least experience in.*

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| <b>Driver<sup>1</sup>:</b>   | Chase |
| <b>Navigator<sup>2</sup>:</b>  | Sonam |
| <b>Quality Control<sup>3</sup> (if the group has three members):</b> |       |

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<sup>1</sup> The driver will be doing the majority of the typing in PyCharm. Your job is to solve the problem given to you by the navigator.

<sup>2</sup> The navigator will be giving directions to the driver, and helping the driver catch syntax and logic errors as he or she creates the code. The navigator should keep track of time and make sure progress is being made.

<sup>3</sup> The quality control specialist will ensure rules are being followed, both in the code (suggesting places to add comments, watching for misspellings, etc.) and in this document (making sure the questions are being answered at the right times, checking for typos, etc.) In a group of two, everyone is responsible for quality control.

## A long time ago...

...in Teamwork T01, remember when we created a text-based adventure game where the user decided what happens in the story?

In the T04 repository that you cloned, you will find **t01\_final\_story.py**, which is the product of your T01 creation. As much as we'd like to enjoy the story now that it is all compiled... it has errors!

One of the many useful skills you'll need to be a programmer is the ability to **refactor code**. Refactoring code is a process where we take code that is already written, and make it better.

So why do we need to refactor T01? Well, there are a number of reasons:

1. Since T01, you've all become much more knowledgeable coders, and you may notice that your code has some design flaws that you now know how to fix. And bugs!
2. Now that you know about functions, you can see the structure of T01 is all wrong per our new rules (i.e., having a `def main();` no code at the top level (no indenting); no mental blocks encapsulated into functions, etc.).
3. This code is broken!
4. This code is kind of a mess!

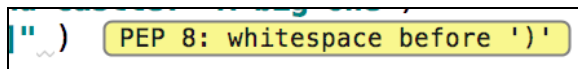
Discuss with your partner two or more ways in which you've improved as a coder since T01. You can refer back to **t01\_final\_story.py** for "inspiration".

2. One way that we have improved as coders is our use of functions. Another way that we have improved is the different types of complicated Syntax that we have learned.

"Better code" can mean a lot of things: easier for the programmer to read; more efficient in terms of lines of code; more efficient in how well it runs; more abstracted, so the code can be reused elsewhere.

You might still be asking, but WHY do we need to refactor T01? Here are two even more compelling reasons:

1. When you leave Berea College and get your fancy job as a programmer, you'll be expected to conform to your company's coding standards (i.e., how your code looks so everyone else in the company can easily read your code). For Python, many companies follow the de facto [PEP 8 Standards](#), and customize them to fit their exact needs. You've likely noticed many gray squiggly lines and warning messages about PEP8 in PyCharm:



Refactoring code is one method you'll need to be familiar with to be an effective programmer, no matter who you work for in the future. ***Every programmer has to refactor code!***

2. By refactoring the T01 code, you're going to improve your skills with writing functions, writing useful documentation, and also learn how to use git to collaborate with the rest of the class. So, making T01 pretty isn't really the goal of this assignment; learning these other **essential** skills is the ultimate goal.

## Your Tasks

For this teamwork, we'll be using git to manage our code. A large part of this teamwork is understanding how git works, and how git facilitates multiple teams of programmers working on one set of code, without clobbering

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each other's work. At a high level, we will clone the code from a repository on Github, make a new branch, make edits to the code, and push those changes back up to Github. Things should get interesting as multiple teams finish their changes and try to push them to the repository. We'll see what happens...

## Branching

So far, we've not used git for collaboration very heavily. In this teamwork, however, everyone in the class will be modifying the same starter code...

To start, create and checkout a new branch. To do this in PyCharm:

1. Right click on the **t04-master** repository folder, then do **Git >> New Branch**. Name the branch you're about to create your username(s) (e.g., **pearcej\_heggens**). Make sure that you are working *on your team's branch* before proceeding.

Inside the **t04\_refactored.py** code, you'll notice a function definition for every team:

```
def team_1_adv():
    pass
    # TODO Add your code here
```

2. Copy your team's code from **t01\_final\_story.py** and paste it into your function. Watch the indentation!
3. Read through your code, and make changes to it when you notice places that could use improvement. Remember, your classmates wrote that code several assignments ago... see how much we've grown as programmers already!
4. Look for gray squiggly lines, indicating places where PEP8 standards aren't being followed. Make the suggested change by PyCharm to remove the squiggles.
5. In your function's docstring, add a link to your team's Google Doc (this document) as well as the names of all partners who worked on that function. For example:

```
def team_1_adv():
    """
    https://docs.google.com/document/...
    Scott Hegg
    Brian Schack
    :return: none
    """
```

Briefly describe any logic changes you made in your code, and why you made them.

3.1: Add the capitalization feature of the input:  
It helps users with capitalization typing habits.

2: We polished punctuations and capitalization of the questions asked in the program.

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|   | <p>3: We added neutral options for users to choose, other than two options already available. We did that to make our program more interactive.</p> <p>4: We added a rerun-the-program loop after user input something other than the three options given, to make this program more interactive when users accidentally type the wrong input.</p> |
| Did you find it challenging following the logic of another group's code? Why or why not?                        | 4. It wasn't too difficult. Everything was still readable.   |
| Briefly describe two or more of the PEP8 warnings you fixed. Does the resulting code look better or worse? Why? | 5. The only errors we got were about line spacing and also where the comments didn't have a space after the #. The code looks much better.   |

## Commit and Push your Changes

Test your code and make sure nothing is broken. Be sure you check ALL combinations of inputs and paths through your logic. When you're confident it's ready to go to the repository, **commit the file** (don't forget to write a meaningful commit message!), and **push** the changes to the repository.

Go to GitHub in your browser, and take a look at [the repo](#).

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| <p>You should notice that there are multiple branches in the Github repository. Find yours and check that your code is there.</p> <p>Compare your branch to master. What's different?</p>  | 4. Our file with the code we made is more updated, other than that, everything is the same.   |
| Do you see other groups' branches in the repo as well? Is your code in their branch? Why or why not?   | 5. Yes we do see them. Our code is not there. This is because what they put on their branch isn't combined with ours until it is put on master. |
| <p>Next, issue a <b>pull request</b> (this is done in the browser on Github).</p> <div>New pull request</div> <p>A pull request is a formal request to add your code into the master branch, for all to see and share. Once you've issued the pull request, communicate to the instructor that you are "ready for a PR review."</p> <p>After the instructor or TA approves your request, refresh Github.</p> <p>Is your code in the master branch now?</p> | 6. Our code should be in the master branch.   |
| What about other groups' code? Is it also in master  | 7. The ones that finished before us are.  |

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| branch, compared to the last time you looked at it in <a href="#">Question 5</a> ?  |  |
| Once your code has been pulled into the master branch, go back to PyCharm. Right click on the directory, and switch back to the master branch by clicking Git >> Branches and selecting “Local Branches” >> Master”.<br><br>Is your code in your <b>local</b> master branch? Why not?   | 8. It looks like that it is in the local master branch. If it isn't, I'm assuming that it won't be there because the master branch for global is being updated, not the local. |
| <p>When you issued the pull request in Github, you (in PyCharm) became out of sync with the repository in Github (i.e., your local is behind the remote). You need to synchronize. To do this, you need to <b>fetch</b> changes from the remote. Go to <b>Git &gt;&gt; Fetch</b> to get all of the changes occurring in the remote repository (i.e., Github). You may see lots of other groups' branches now, depending on how quickly you're working through this assignment. You can fetch multiple times to see updates as master changes.</p> <p>However, fetch only grabs <i>references</i> to each branch; the code hasn't been pulled into your local computer yet. <b>Git &gt;&gt; Pull...</b> allows you to actually bring the code from Github to your machine.</p> <p>When you <b>pull</b>, Git does its best to <b>merge</b> the remote changes into your local changes. If there are conflicts, PyCharm will warn you. More on that later... if you get into this situation, ask for help.</p> <p>Finally, PyCharm did some work to help simplify this process by combining these three steps into a single button: Git &gt;&gt; Update Project. I don't mind if you use this button, but you do need to understand the three operations described above: <b>Fetch, Pull, Merge!</b></p> |  |

## Git Terminology

Git can be challenging to wrap your head around when you're first learning it, especially when collaboration becomes a part of the process. So, let's make sure we understand the basic terms; the details of using git will be touched upon again in your homework assignment, in more detail.

Define each term:

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| Clone        | 9.a.it basically means creating a local copy of a repository hosted on Github.                             |
| Commit       | 9.b.It means the action of saving changes to the files in a local repository.                              |
| Push         | 9.c.It means the action of uploading local commits and changes from local repo to a remote repo on Github. |
| Branch       | 9.d.It's a parallel line of development that diverges from the main line of development.                   |
| Pull         | 9.e.the process of fetching changes from a remote repo and merging them into the local repo.               |
| Pull request | 9.f.It to propose changes to a repo hosted on a remote server,   |

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| Merge  | 9.g. The process of combining changes from one branch into another branch.                                |
| Remote | 9.h. A copy of a Git repository that is hosted on a server  |
| Local  | 9.i. The environment on your own computer where you are working with a Git repository                     |
| Fetch  | 9.j. The process of retrieving changes from a remote repository and storing them in your local repository |

Check your definitions against the [git glossary](#) to ensure they are correct.

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| <p>In Github, go to the <a href="#">Network Graph</a> (i.e., a history of branching and committing history).</p> <p>Discuss with your partner what confusions you still have about the git workflow you experienced today, using the network graph to explore what has happened. Write your unanswered questions in the space to the right:</p> | <p>10. What does “checking out” do? What happens to the branches while you check out?</p> |
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## Submission Instructions

At the end of every assignment, I will include these instructions. They do change on occasion, so be sure you check them each assignment to ensure no special instructions were added.

Follow the [submission instructions](#) by Friday at 11:55PM.