Exercise 09 - Advanced Git

Deadline

January 11, 2021 - 12:00/noon (UTC+1:00)

Submission Guidelines

1. Clone your repository to your local workstation/computer if you have not done so
2. Structure and work on your submission.
   - Create a directory (folder) for the exercise sheet, e.g. name the directory "exercise09" for Exercise 09.
   - Place all relevant files/scripts in this newly made directory
   - Do not include the `.git` folder!
3. Commit your work to the git repository.
4. Create a git tag.
   - Tag name must be equivalent to "SubmissionExerciseSheet09".
   - Tag can be made via the command line or using the GitLab GUI

Grading (10 pts):

Task	1	2	3	4	5
Points	2	2	2	2	2

Tasks

For the written responses, save your answers to a PDF called "exercise09_answers.pdf" and push it to your `exercise09` folder in your repository.

Task 1 - *To Reset or to Revert* (2 pts)

What is the difference between `git reset` and `git revert`. When would you use one over the other?

Task 2 - *To Merge or to Rebase* (2 pts)

What is the difference between `git merge` and `git rebase`. When would you use one over the other?

Task 3 - *Branching* (2 pts)

Up to this point, you have most likely only worked in one branch of your repository - the **master** branch. The master branch is typically where the most recent, stable version of a software package is kept. New features and any changes to code usually are made and tested in a separate branch and then merged to the master branch after passing the quality checks and unit tests. Here you will make a new branch and push a new file to it.

1. Create a new branch called "ex09" and switch to it (1 pt)
   - If you are working in PyCharm, click on the button in the bottom right of the window that says "master" and click "**+ New Branch**"
     - Under "New branch name:" enter "ex09" and make sure "Checkout branch" is checkmarked then click "**Create**"
     - *Note*: You should now see "ex09" where it used to say "master" in the bottom right. This means you are working in the "ex09" branch
2. While working in the "ex09" branch, make a new `README.md` file in your `exercise09` directory (1 pt)

- Add the following to the new `README.md` file:

```
# Exercise 09 README
This is my exercise09 README file in the ex09 branch.
I am happy to have a break soon.
```

- Commit this file and push it to the remote repository
- *TIP*: Go to GitLab and check that you have a new branch in your repository. In your root page, you should see a drop down menu in the upper left region that says "master". Click it and you should see "ex09".

Task 4 - *They See Me Merging, They Hatin* (2 pts)

In this exercise, you will demonstrate your ability to handle a merge conflict within your own repository. Be sure to follow these instructions precisely.

1. Make a new `README.md` file in your `exercise09` directory on the **master** branch (1 pt)

- Checkout the **master** branch
    - If you are working in PyCharm, click on the button in the bottom right that says "ex09", then click on "master", then "**Checkout**"
    - You can also checkout the branch using the command line if you wish
- Navigate to your `exercise09` folder where you should **NOT** see a README file
- Add a new `README.md` file in your `exercise09` directory (same place you did in the "ex09" branch) and add the following to the new `README.md` file:

```
# Exercise 09 README
This is my exercise09 README file in the master branch.
I am __VERY__ happy to have a break soon.
```

- Commit it and push the file to your remote repository

1. While working in the **master** branch, merge the "ex09" branch into the **master** branch (1 pt)

- If working in PyCharm, click on the branch button in the bottom right (should say "master")
    - *Note*: If you are using another IDE, then you will have to look up documentation for how to merge branches for that software. It is most likely very similar to the instructions below. Do this via the command line is **not** recommended
- Click on "ex09" and then click on "**Merge into Current**"
    - This means you want to merge "ex09" into the "master" branch
- You should see a dialog box pop up called "**Conflicts**" saying that the `README.md` file has conflicts
    - For future reference: "Accept Yours" means take **all** changes in the current branch and ignore those in the other branch, "Accept Theirs" means the opposite. You rarely will ever click these, often you want to take some changes from both branches involved
- Click on "**Merge…**" on the right side
    - *Note*: You should now see the master branch version of the README on the left side, the ex09 version on the right, and a composite in middle
- Using the arrows in between window panes, add the text from both the master version **and** the ex09 branch's version to the composite in the middle
- Click "**Apply**" at the bottom
- Push the merged file to your remote repository
- *TIP*: Go to GitLab and check your commit history. You should see "Merge branch 'ex09'" there

Task 5 - *Holiday Cheer* (2 pts)

1. Make a python script called `holiday_cheer.py` in your `exercise09` folder (1 pt)
2. Add code to this script so that when executed, it will print a festive/fun picture to STDOUT (1 pt)
    - *HINT*: Don't be afraid to look up some fun ASCII art

Have a good break!