Assignment Guidance

Integrative Computational Biology

2023-Spring

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📞If you have any question, ask question in Q&A board or send email

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1. Start with GitHub

Assignment will be provided through GitHub Classroom.

Please make a GitHub account before starting assignment.
https://github.com

Issue GitHub Token

- Since August 13, 2021, git no longer supports password authentication. You must use **personal access token** for authentication.

- To issue a token, please follow as the link below.
  https://docs.github.com/en/authentication/keeping-your-account-and-data-secure/creating-a-personal-access-token#creating-a-personal-access-token-classic

- Please make sure to save token somewhere.

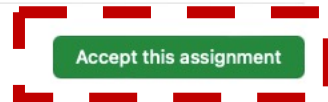# Start assignment with GitHub Classroom

1. Click the invitation link to the assignment and Accept the assignment.

You can open assignment directly in VS Code if you use that.

Go directly to your repository

2. Set up

Option1. Use your local environment (bash environment available)
- You must pre-install [docker](#) and be available for setting dependencies

Option2. [Google cloud shell](#) editor (bash environment not available)
- If you need guidance for Google cloud shell, [link](#).

Clone your repository

- Open the terminal and clone your repository

```
git clone <GitHub_repository_link>
cd ./<GitHub_repository_name>
```

```
eunbelivable@cloudshell:~$ ls
README-cloudshell.txt
eunbelivable@cloudshell:~$ git clone https://github.com/icb-2023-1/beta-assignment
-ta-profile.git
Cloning into 'beta-assignment-ta-profile'...
Username for 'https://github.com': ta-profile
Password for 'https://ta-profile@github.com':

remote: Enumerating objects: 16, done.
remote: Counting objects: 100% (16/16), done.
remote: Compressing objects: 100% (11/11), done.
remote: Total 16 (delta 2), reused 10 (delta 0), pack-reused 0
Receiving objects: 100% (16/16), 537.04 KiB | 2.77 MiB/s, done.
Resolving deltas: 100% (2/2), done.
eunbelivable@cloudshell:~$
eunbelivable@cloudshell:~$ ls
beta-assignment-ta-profile  README-cloudshell.txt
eunbelivable@cloudshell:~$ cd beta-assignment-ta-profile/
eunbelivable@cloudshell:~/beta-assignment-ta-profile$
```

Clone your repository

Enter username and password(token)
❗For password, you should enter "token"
❗ It is normal for token not to appear in the interface

Change directory to your cloned reposiroty

Brief introduction of directory

```
eunbelivable@cloudshell:~/beta-assignment-ta-profile$ ls
command  data  img  main.sh  README.md  restart.sh  result  setup.sh
```

- command: directory to store commandXX.sh files.
  In commandXX.sh files, you should write your commands

- data: directory to store data files used for assignment.

- result: result directory to save the result files of your command files.

- main.sh: execute all your command files in command directory in once.

- restart.sh: restart docker

- setup.sh: set up docker to solve assignment
  ❗ Please make sure to run docker solving assignment.

- etc (you don't have to touch or execute the contents below)
  - README.md: contain guidance for assignment
  - img: contain images

Workflow

```
eunbelivable@cloudshell:~/beta-assignment-ta-profile$ ls
command  data  img  main.sh  README.md  restart.sh  result  setup.sh
```

- While you solve the assignment, you may change command, data and result directory.
- Workflow
    1. Set up docker before you start.
    `./setup.sh`
    2. After you set up, you can see you user account changed.
    Path of copied directory is **/home/exercise03/exercise03**.
    Please work in this directory
    3. Write command lines(command)
    (./command/commandXX.sh)
    4. Save outcome of command file to result directory
    (./result/resultXX_X.txt or ./result/resultXX_X.csv)

```
eunbelivable@cloudshell:~/beta-assignment-ta-profile$ ./setup.sh
Unable to find image 'khb7840/introbioinfo-exercise03:latest' loca
latest: Pulling from khb7840/introbioinfo-exercise03
e79bb959ec00: Pull complete
7dc808d5d247: Pull complete
7a8d7e31e945: Pull complete
39387c6ab5c0: Pull complete
fa8c9cb53acf: Pull complete
dea1ecfe9c32: Pull complete
Digest: sha256:60fc7d81d307cbb758a433194c25c895539ea83abadc436e78
Status: Downloaded newer image for khb7840/introbioinfo-exercise0
exercise03@539066f8c6c9:~$ ls
README  exercise03
exercise03@539066f8c6c9:~$ cd exercise03/
exercise03@539066f8c6c9:~/exercise03$
```

You can choose either of followings to save each output (Go to example)
1) Copy the output and Paste into specified file
2) Redirect

Execution

```
eunbelivable@cloudshell:~/beta-assignment-ta-profile$ ls
command   data   img   main.sh   README.md   restart.sh   result   setup.sh
```

- Run commandXX.sh independently
  ```
  bash ./command/commandXX.sh
  ```

- Run all commandXX.sh files
  ```
  bash ./main.sh
  ```

FAQ

- If you want to use "relative path" to redirect your result, assume your current directory is **/home/exercise03/exercise03**.

- Your assignment will be **graded with automated scripts**.
  We will reproduce your result file with main.sh file and grade based on reproduced file.
  Please make sure your command files to be executed and be careful with typo, path and error.

- ❗Tools needed for the assignment is pre-installed in docker. Do not install any additional tools.

- ❗If you can't execute a shell file due to "Permission denied error", please try this command and re-execute.
  `chmod +x ./<SOME_SHELL_FILENAME>.sh`

- ❗When you exit from the docker and you want to rerun the docker,
  `./restart.sh`

- ❗If docker is not set up, please check if you are already running docker.

- You can refer to the slide to see an example.

3. Submit

Option1. Push the cloned repository

Option2. Use the GitHub interface

Guidance

- You can submit multiple times and your last submission will be graded.

- If you didn't make commit on time, your solution will not be graded.

- Only push files in command and result directory. Do not push files in other directories. (e.g. data directory)

Option1. Push the cloned repository

- At initial stage, you should tell git about your profile.

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

1. Add edited files to git

2. Commit with commit message

3. Submit your answers by pushing the cloned repository
   You may need your github ID and password(token) in this step

```
git add .
git commit -m "Initial commit" # You can change message as you want
git push origin main
```

```
exercise03@539066f8c6c9:~/exercise03$ git add .
exercise03@539066f8c6c9:~/exercise03$ git commit -m "finished assignment"
[main 1cb51be] finished assignment
 2 files changed, 2 insertions(+), 2 deletions(-)
exercise03@539066f8c6c9:~/exercise03$ git push origin main
Username for 'https://github.com': ta-profile
Password for 'https://ta-profile@github.com':
Counting objects: 8, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (6/6), done.
Writing objects: 100% (8/8), 816 bytes | 0 bytes/s, done.
Total 8 (delta 3), reused 0 (delta 0)
remote: Resolving deltas: 100% (3/3), completed with 2 local objects.
To https://github.com/icb-2023-1/beta-assignment-ta-profile.git
   6780dfe..1cb51be  main -> main
```
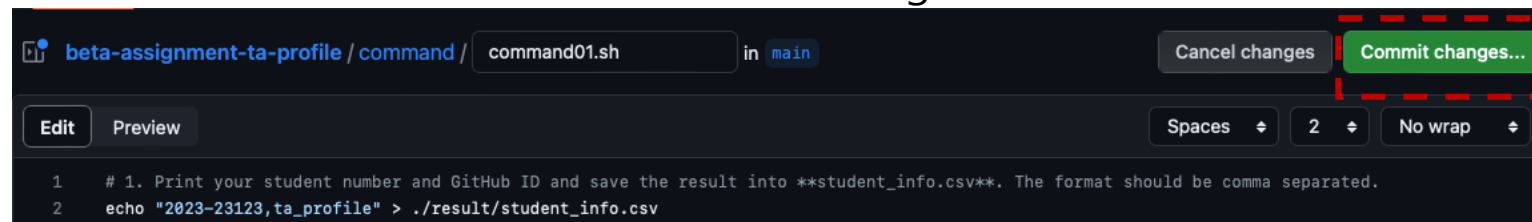
Option2. Use GitHub interface

If you are not familiar with git, you can use the interface as an alternative.

1. Go to a file to edit and click the pencil icon at the top right corner.
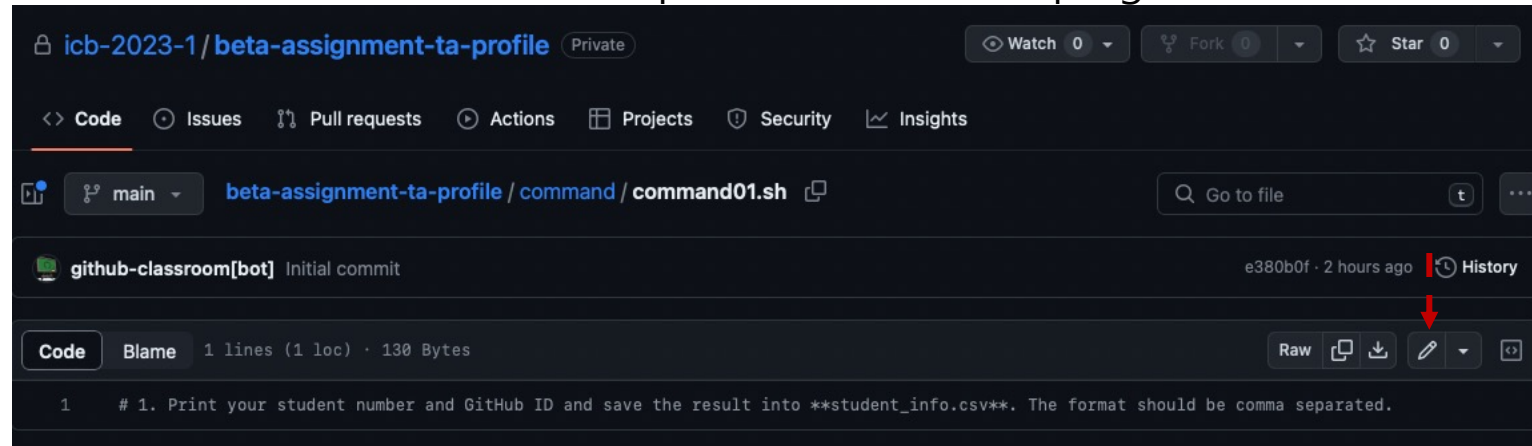
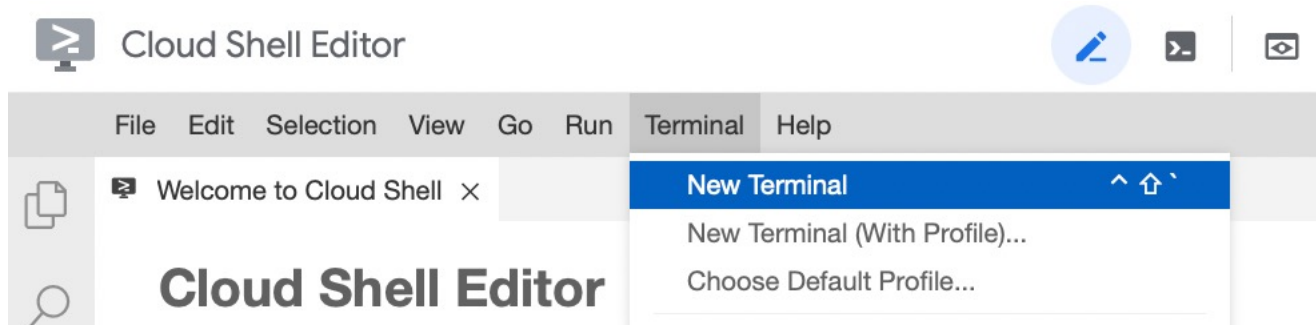2. Edit the file with the text editor and click the green button

❗Conflict can be occurred if you change files in the interface.

If you want to reflect changes in the interface, pull your remote to local `git pull`
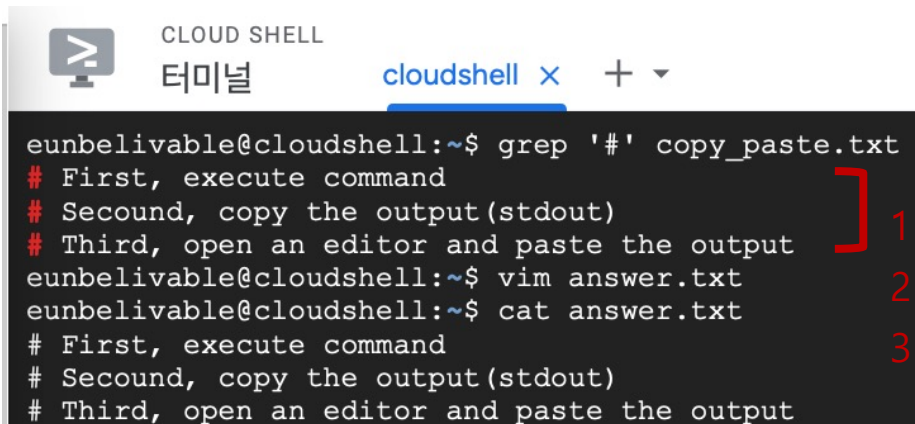
4. Supporting Information

Introduce CloudShellEditor

1. Open the link https://ide.cloud.google.com
2. Open a terminal from the cloud shell editor.

- As a free service, it has some limitations
    - It takes some time when initiating.
    - 5GB storage limit
    - Cannot be opened with secret mode of browser
    - If the session is inactive for 20 minutes, the instance is terminated and any modification outside $HOME will be deleted
    - Weekly usage limitation: ~50hrs
    - If you don't access cloud shell for 120 dyas, the $HOME will be deleted.
- You can see details in https://cloud.google.com/shell/docs/editor-overview?hl=ko

Write Result File (choose either of options)
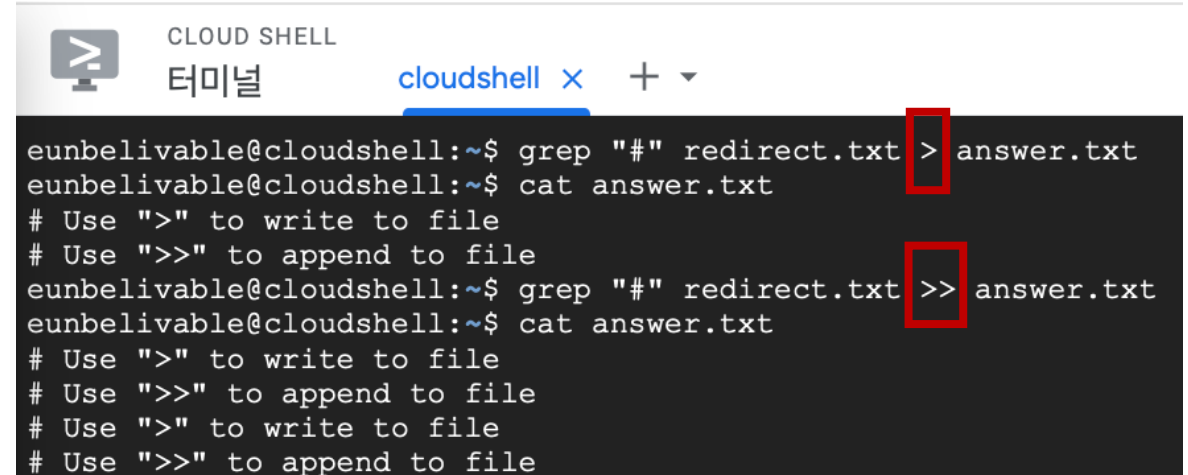
Copy and Paste


```
eunbelivable@cloudshell:~$ grep '#' copy_paste.txt
# First, execute command
# Secound, copy the output(stdout)      ⎤ 1
# Third, open an editor and paste the output ⎦
eunbelivable@cloudshell:~$ vim answer.txt    2
eunbelivable@cloudshell:~$ cat answer.txt    3
# First, execute command
# Secound, copy the output(stdout)
# Third, open an editor and paste the output
```

1. Copy output
2. Open an editor and Paste
3. Check if solution saved

Redirect


```
eunbelivable@cloudshell:~$ grep "#" redirect.txt > answer.txt
eunbelivable@cloudshell:~$ cat answer.txt
# Use ">" to write to file
# Use ">>" to append to file
eunbelivable@cloudshell:~$ grep "#" redirect.txt >> answer.txt
eunbelivable@cloudshell:~$ cat answer.txt
# Use ">" to write to file
# Use ">>" to append to file
# Use ">" to write to file
# Use ">>" to append to file
```

- For details, read the link
  https://en.wikipedia.org/wiki/Redirect_(computing)

Assignment Example

❗Note that this example used pseudo assignment

1. Set up docker
2. Write command line to ./command/command01.sh

3. Run all the command files

1. Write commands.
2. As you can see here, there's no result file yet.
3. Execute main.sh to run all the command files.
4. Result file (student_info.csv) generated