

# Homework 3 Instructions

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The homework assignment is to be done in groups of up to 3 students. Submission deadline is 14th of June 2019. Note that this assignment combines assignment 3 and 4 into one, and so there will be no additional assignment. However, this assignment will carry the weight of 2 assignments (so, 15% of the grade)<sup>1</sup>. We advise you to start working on the assignment early on and work in groups of 3 as this is a large assignment.

Also note that Parts 1, 2 and 5 are optional, and will not be marked, but highly recommended to get a better understanding of the material, and will help you in preparation for the exam.

For this assignment, we will be using google cloud, to run our code on a GPU.

## 1 Setup

### Step I

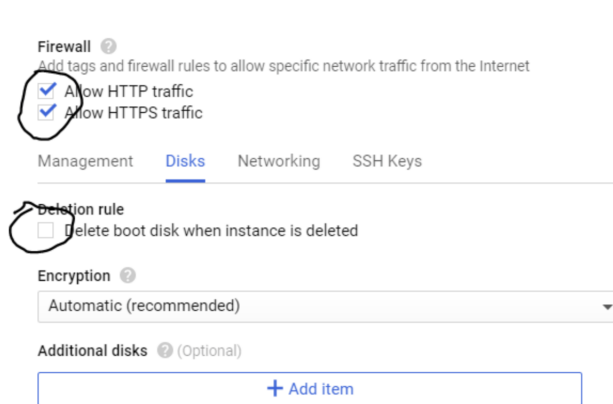
Please follow the tutorial on Google Cloud (given alongside assignment 1) to install and google cloud gpu instance. Note the following:

1. Unlike the instructions in tutorial, we'll need to use 100GB of space for our instance, if you already installed it with 30GB, please delete the instance and install it again with 100GB.
2. When creating the instance, make sure to allow the following firewall settings:

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<sup>1</sup>This homework assignment is an adaptation of the one from the cs236605 course: <https://vistalab-technion.github.io/cs236605/>

Some firewall settings:-



This can also be edited once the instance was already created (Go to 'VM Instances', select your vm instance, then select 'edit' and change the setting).

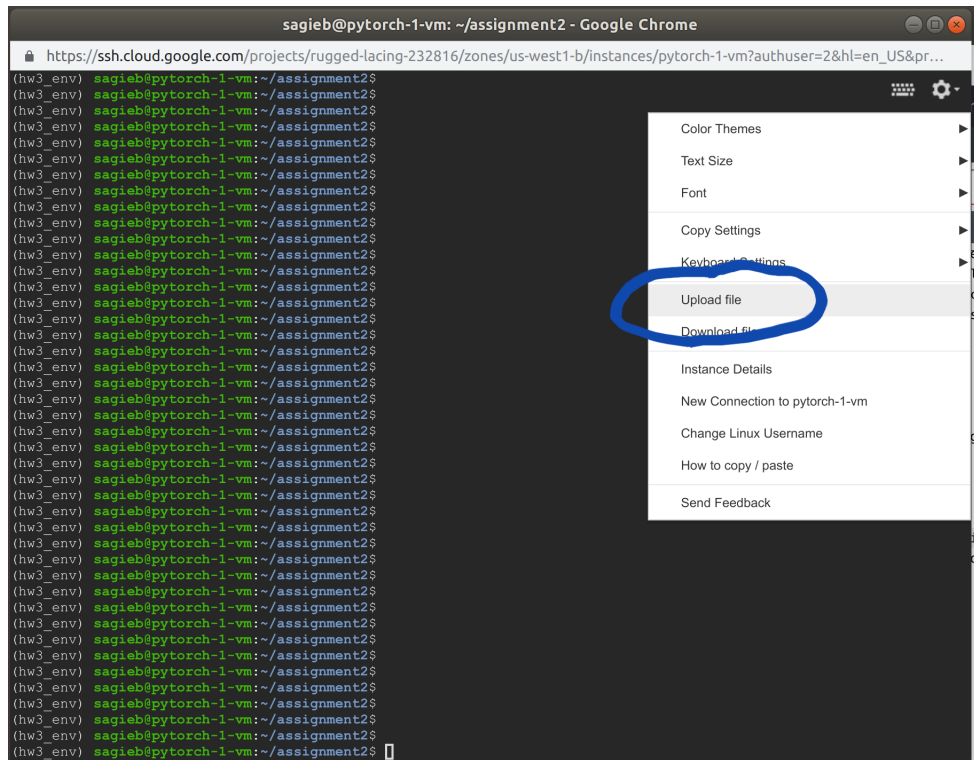
3. Please, **DO NOT FORGET TO STOP YOUR INSTANCE**, once you finished working with it. If you are finished for the day, stop the instance and start it again later.
4. Verify that you are accessing Google Cloud via your .tau.ac.il account (and not, say, gmail account) as the coupon provided to you was linked to that address.

## Step II

Next, follow steps 4 to 6 of the following guide: <https://towardsdatascience.com/running-jupyter-notebook-in-google-cloud-platform-in-15-min-61e16da34d52>.

## Step III

Download assignment.zip file from moodle. Then upload it to the vm instance using the upper right button:



Unzip the folder in the vm instance and install Jupyter and Conda as in the instructions of assignment 1. Note that the conda environment created is now hw3\_env and not hw1.env.

#### Step IV

Next, follow steps 8 of the guide given in Step II. **Differently to the guide, please add the line:**

```
c.NotebookApp.ip = '0.0.0.0'
```

Instead of:

```
c.NotebookApp.ip = '*'
```

#### Step IV

Lastly, go to the 'assingment3' folder in the vm (using the command line). Making sure hw3\_env is activated, run the following:

```
jupyter-notebook --no-browser --port=<PORT-NUMBER> &
```

Where PORT-NUMBER is the port you selected earlier. This will show something like this:

```
sagieb@pytorch-1-vm: ~/assignment2 - Google Chrome
https://ssh.cloud.google.com/projects/rugged-lacing-232816/zones/us-west1-b/instances/pytorch-1-vm?authuser=2&hl=en_US&pr...
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$ jupyter lab --no-browser --port=5000 &
[1] 2242
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$ [1 15:07:29.383 LabApp] Writing notebook server cookie secret to /run/
user/1001/jupyter/notebook_cookie_secret
[1 15:07:30.775 LabApp] JupyterLab extension loaded from /home/sagieb/.conda/envs/hw3_env/lib/python3.7/site-packag
es/jupyterlab
[1 15:07:30.775 LabApp] JupyterLab application directory is /home/sagieb/.conda/envs/hw3_env/share/jupyter/lab
[1 15:07:30.777 LabApp] Error loading server extension nbdtm
Traceback (most recent call last):
  File "/home/sagieb/.conda/envs/hw3_env/lib/python3.7/site-packages/notebook/notebookapp.py", line 1572, in in
it_server_extensions
    mod = importlib.import_module(module_name)
  File "/home/sagieb/.conda/envs/hw3_env/lib/python3.7/importlib/_init_.py", line 127, in import_module
    return _bootstrap.gcd_import(name[level:], package, level)
  File "<frozen importlib._bootstrap>", line 1006, in _gcd_import
  File "<frozen importlib._bootstrap>", line 983, in _find_and_load
  File "<frozen importlib._bootstrap>", line 965, in _find_and_load_unlocked
ModuleNotFoundError: No module named 'nbdtm'
[1 15:07:30.848 LabApp] JupyterLab server extension not enabled, manually loading...
[1 15:07:30.851 LabApp] JupyterLab extension loaded from /home/sagieb/.conda/envs/hw3_env/lib/python3.7/site-packag
es/jupyterlab
[1 15:07:30.851 LabApp] JupyterLab application directory is /home/sagieb/.conda/envs/hw3_env/share/jupyter/lab
[1 15:07:30.851 LabApp] Serving notebooks from local directory: /home/sagieb/assignment2
[1 15:07:30.852 LabApp] The Jupyter Notebook is running at:
[1 15:07:30.852 LabApp] http://(pytorch-1-vm or 127.0.0.1):5000/?token=5866082127f21b5a356d66ecb13b6eb8e2f3e8da8cb9
71d1
[1 15:07:30.852 LabApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 15:07:30.874 LabApp]

To access the notebook, open this file in a browser:
file:///run/user/1001/jupyter/nbserver-2242-open.html
Or copy and paste one of these URLs:
http://(pytorch-1-vm or 127.0.0.1):5000/?token=5866082127f21b5a356d66ecb13b6eb8e2f3e8da8cb971d1
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$
(hw3 env) sagieb@pytorch-1-vm:~/assignment2$
```

Copy the token as marked above. Then from outside your vm, on you local browser, navigate to:

`http://<External Static IP Address>:<Port Number>`

Where External Static IP Address is the static IP of your vm, which you can find in the 'VM instances' folder in google cloud.

To get a better understanding of google cloud, you can read the following:  
<https://cloud.google.com/compute/docs/instances/transfer-files>,  
<https://cloud.google.com/compute/docs/instances/connecting-to-instance>

## 2 Assignment

### 2.1 Working with the Assignment

The folder structure is the same as for assignment 1. Follow the notebooks instructions starting from notebook 0. You are only required to change the code in the folder hw3.

**Important:** When you run you code on jupyter lab, which you opened in Step V, this will run directly on the remove vm. However, when you write your

solutions, you can either write them directly on the remote vm, or write them locally, and upload the file that you changed to the vm. Whenever you complete a TODO task, you'll need to upload the file to the vm (under hw3) and then continue running on jupyter.

As in assignment 1:

1. The notebooks contain material you need to know, instructions about what to do and also code blocks that will test and visualize your implementations.
2. Within the notebooks, anything you need to do is marked with a TODO beside it. It will explain what to implement and in which file.
3. Within the assignment code package, all locations where you need to write code are marked with a special marker (YOUR CODE). Additionally, implementation guidelines, technical details and hints are in some cases provided in a comment above.
4. Sometimes there are open questions to answer. Your answers should also be written within the assignment package, not within the notebook itself. The notebook will specify where to write each answer.

## 2.2 Submitting your work

On the remote vm, if you didn't completed some optional parts, simply remove the corresponding ipynb file (or move it to another directory). Then, as for assignment 1, run:

```
python main.py prepare-submission --id ID1 --id ID2 --id ID3
```

where ID1, ID2 and ID3 are your id numbers.

If there are errors when running your notebooks, it means there's a problem with your solution or that you forgot to implement something. Additionally, you can use the `--skip-run` flag to skip running your notebooks (and just merge them) in case you already ran everything and you're sure that all outputs are present:

```
python main.py prepare-submission --skip-run --id ...
```

If you are unable to solve the entire assignment and wish to submit a partial solution you can create a submission with errors by adding an `--allow-errors` flag, like so:

```
python main.py prepare-submission --allow-errors --id ...
```

Finally zip the output, download the zip file from the remote vm, and submit it on Moodle.

Good luck, and once again, **WHEN YOU ARE DONE WORKING, STOP YOUR VM INSTANCE :)**