Math 364: Principles of Optimization

Instructor: **Mostafa Rezapour***

Jupyter Notebook Installation

Note: I will show you all the following steps during the lecture or office hours again if necessary. Please do not worry if you are not familiar with *Python* or how to install it. One of my goals of teaching this course is to show you how to convert a real-world optimization problem to machine language and get it solved. I will switch between *Python* and *Matlab* frequently. I am sure for those who are not familar with programming, this is beyond of their comfort zone. Please do not worry at all. I will teach you what you need to know about programming for this course from A to Z.

1 How to install Jupyter Notebook

During this semester, I would like to show you how to use *Python* to solve LP's. For this purpose, I would like you to install Jupyter Notebook on your laptop (if it is possible). Please go through the following steps one by one in order:

- Please download **Python 3.7** from *https://www.anaconda.com/distribution/* and install it.
- Open **Anaconda prompt** (you can find it by searching "*anaconda prompt*" in your search bar).
- Now, we want to create a virtual environment so that we are able to install different packages that we need for **Math 364, Spring 2020**:
    1. In Anaconda prompt, please type [in front of *(base)*]:

    conda create -n Math364 python=3.6

    In fact, by this command, we create a new virtual environment whose name is *Math 364* and install *python 3.6* on it. I prefer to work with *Python 3.6*, which is compatible with more packages that we need to use. Also you can create more

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virtual environment with different names and different *python* versions.

2. Now, we activate this new virtual environment by the following command [in front of *(base)*]:

activate Math364

3. Now, we install Jupyter Notebook on this virtual environment by the following command [in front of *(Math364)*]:

conda install -y jupyter

4. Now, we install necessary packages by using *pip* as follows: (we only install a few common packages, and then we will add more packages as we go forward through the semester) [in front of *(Math364)*]:

pip install –exists-action i –upgrade sklearn

pip install –exists-action i –upgrade pandas

pip install –exists-action i –upgrade matplotlib

pip install –exists-action i –upgrade pulp

More packages can be added as above.

- Finally, we activate this new virtual environment on Jupyter Notebook by the following command:

python -m ipykernel install –user –name Math364 –display-name "Python 3.6 (Math364)"

2 How to open and use Jupyter Notebook

– 1. Open Anaconda Prompt

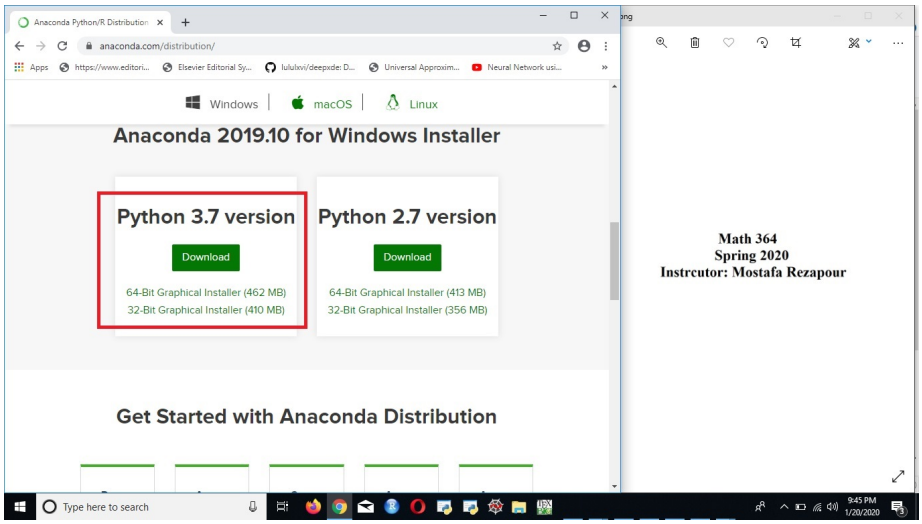
– 2. Activate Math364

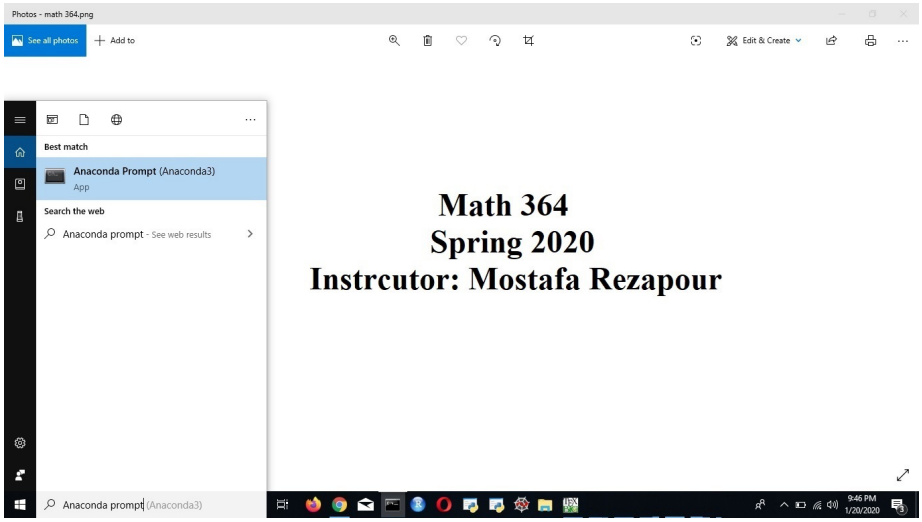
– 3. Choose your directory. (for instance, you should create a new folder named "optimization364" in your directory and then by *cd* command change the directory

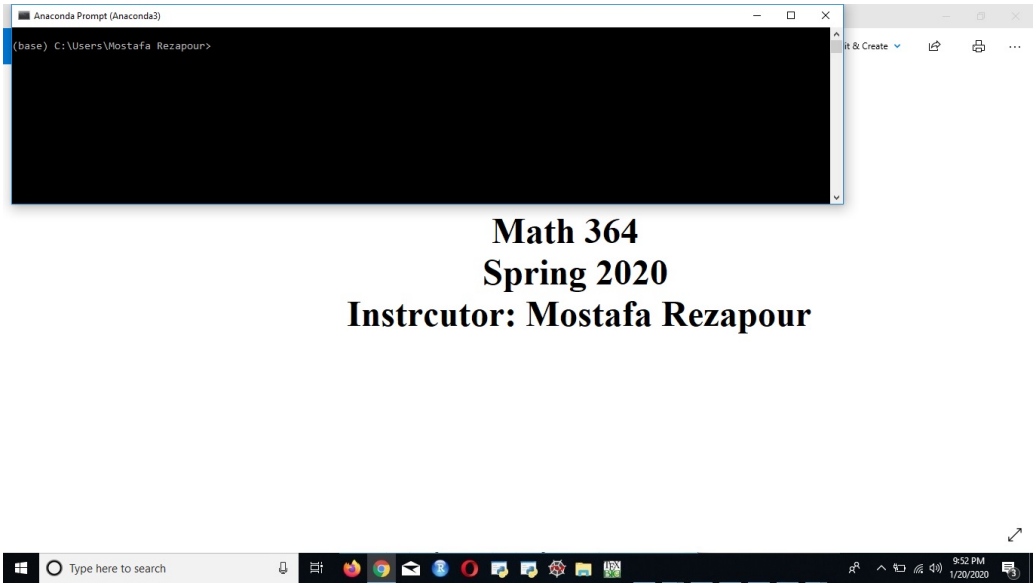
– 4. Type " Jupyter Notebook" and push *Enter* key.

– 5. Finally, your default browser will open, and you will have access to Jupyter Notebook.

– 6. You should change your *Kernel* to *Python 3.6(Math364)*. Then we can start coding.






Anaconda Prompt (Anaconda3)
(base) C:\Users\Mostafa Rezapour>
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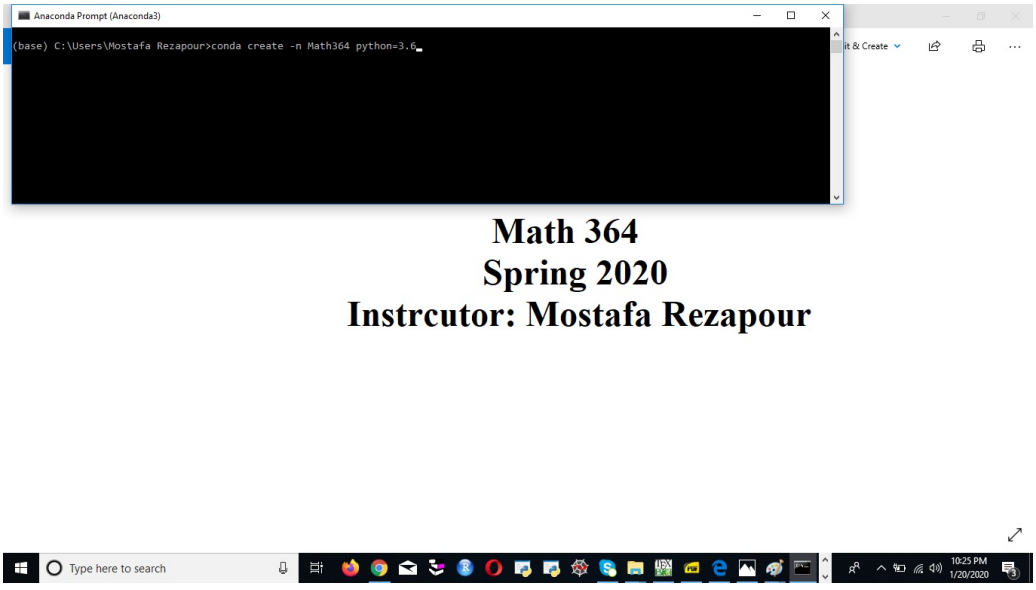
Anaconda Prompt (Anaconda3)
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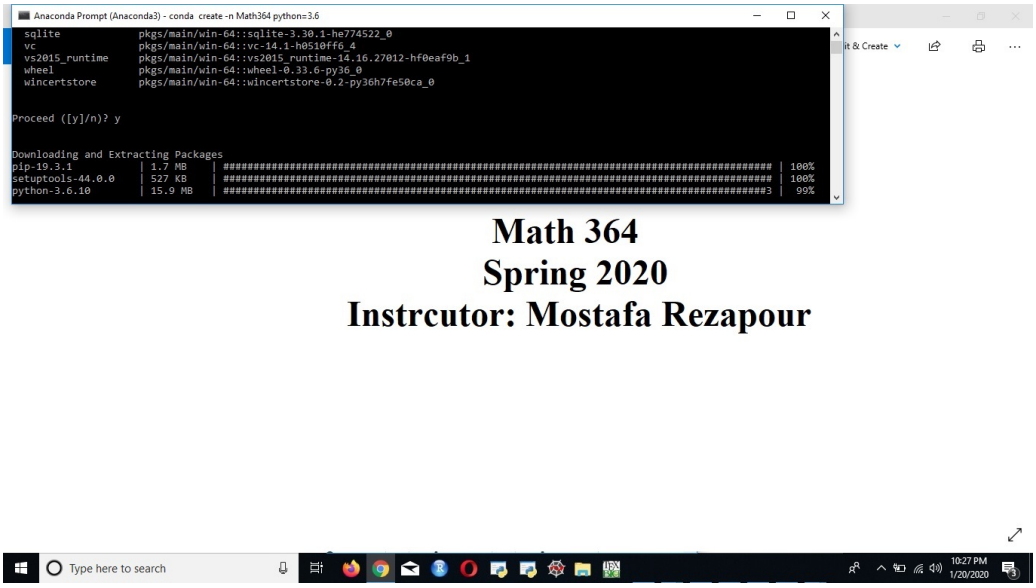
Anaconda Prompt (Anaconda3) - conda create -n Math364 python=3.6
sqlite pkgs/main/win-64::sqlite-3.30.1-he774522_0
vc pkgs/main/win-64::vc-14.1-h0510ff6_4
vs2015_runtime pkgs/main/win-64::vs2015_runtime-14.16.27012-hf0eaf9b_1
wheel pkgs/main/win-64::wheel-0.33.6-py36_0
wincertstore pkgs/main/win-64::wincertstore-0.2-py36h7fe50ca_0
Proceed ([y]/n)? y
Downloading and Extracting Packages
pip-19.3.1 | 1.7 MB | 100%
setuptools-44.0.0 | 527 KB | 100%
python-3.6.10 | 15.9 MB | 99%
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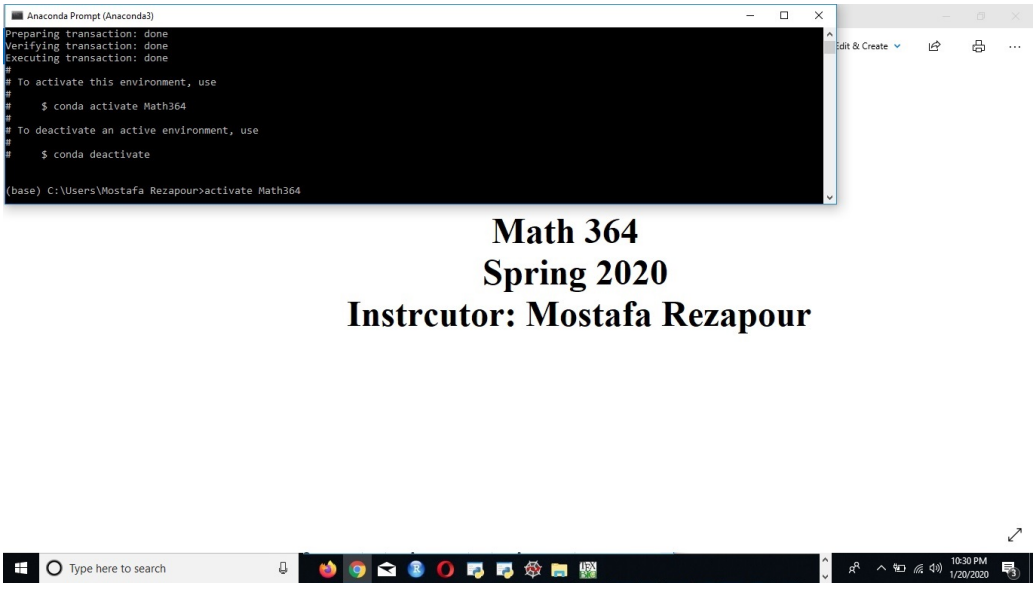
Anaconda Prompt (Anaconda3)
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
To activate this environment, use
$ conda activate Math364
To deactivate an active environment, use
$ conda deactivate
(base) C:\Users\Mostafa Rezapour>activate Math364
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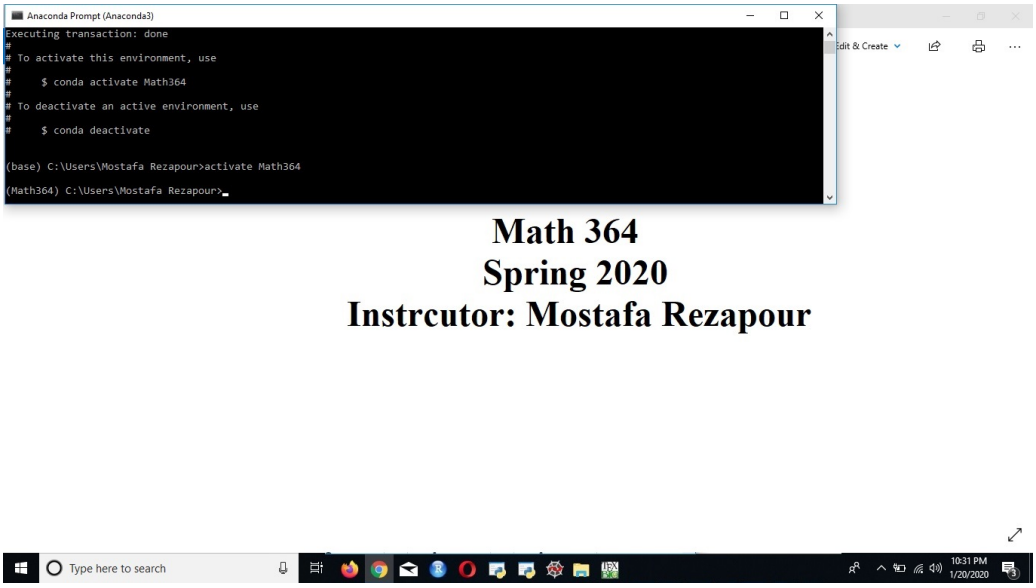
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Executing transaction: done
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To activate this environment, use
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$ conda activate Math364
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To deactivate an active environment, use
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$ conda deactivate
(base) C:\Users\Mostafa Rezapour>activate Math364
(Math364) C:\Users\Mostafa Rezapour>
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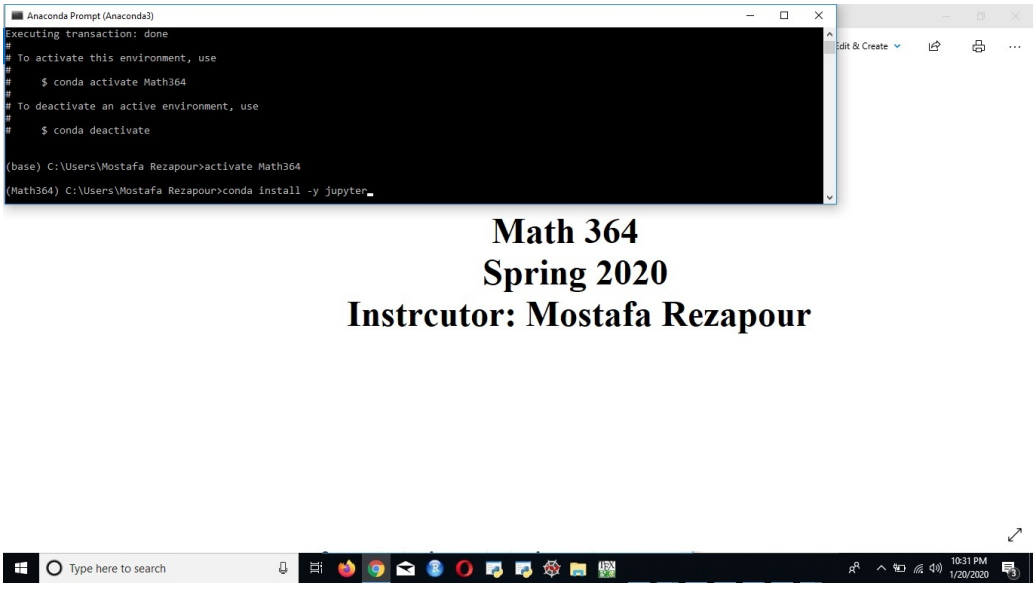
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#
$ conda activate Math364
#
To deactivate an active environment, use
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$ conda deactivate
(base) C:\Users\Mostafa Rezapour>activate Math364
(Math364) C:\Users\Mostafa Rezapour>conda install -y jupyter
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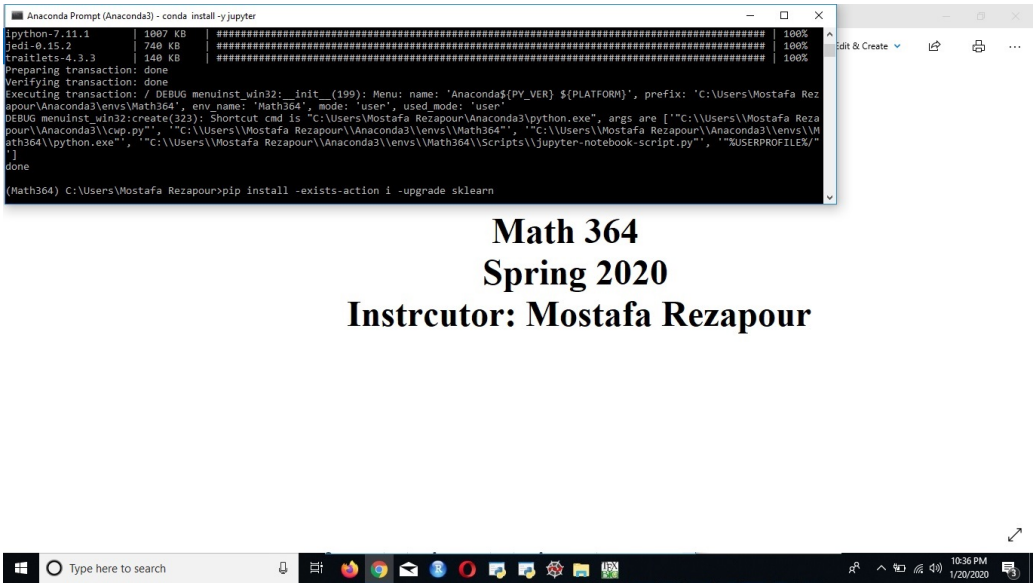
Anaconda Prompt (Anaconda3) - conda install -y jupyter
ipython-7.11.1 | 1007 KB | ########## | 100%
jedi-0.15.2 | 740 KB | ########## | 100%
traitlets-4.3.3 | 140 KB | ########## | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: / DEBUG menuinst_win32:__init__(199): Menu: name: 'Anaconda${PY_VER} ${PLATFORM}', prefix: 'C:\Users\Mostafa Rezapour\Anaconda3\envs\Math364', env_name: 'Math364', mode: 'user', used_mode: 'user'
DEBUG menuinst_win32:create(323): Shortcut cmd is "C:\Users\Mostafa Rezapour\Anaconda3\python.exe", args are ['"C:\\Users\\Mostafa Rezapour\\Anaconda3\\cwp.py"', '"C:\\Users\\Mostafa Rezapour\\Anaconda3\\envs\\Math364"', '"C:\\Users\\Mostafa Rezapour\\Anaconda3\\envs\\Math364\\python.exe"', '"C:\\Users\\Mostafa Rezapour\\Anaconda3\\envs\\Math364\\Scripts\\jupyter-notebook-script.py"', '"%USERPROFILE%/"']
done
(Math364) C:\Users\Mostafa Rezapour>pip install -exists-action i -upgrade sklearn
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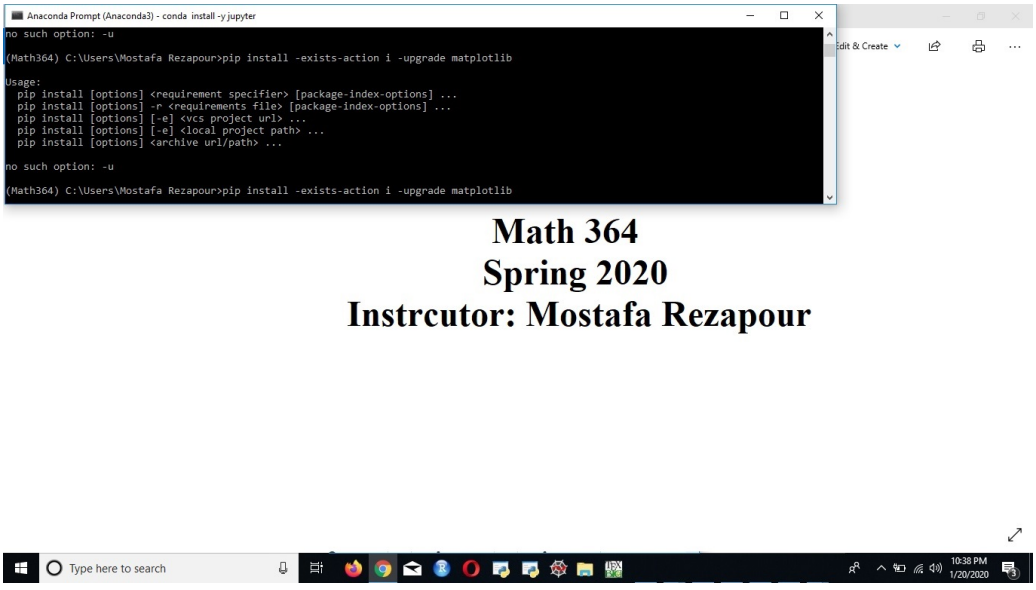
Anaconda Prompt (Anaconda3) - conda install -y jupyter
no such option: -u
(Math364) C:\Users\Mostafa Rezapour>pip install -exists-action i -upgrade matplotlib
Usage:
pip install [options] <requirement specifier> [package-index-options] ...
pip install [options] -r <requirements file> [package-index-options] ...
pip install [options] [-e] <vcs project url> ...
pip install [options] [-e] <local project path> ...
pip install [options] <archive url/path> ...
no such option: -u
(Math364) C:\Users\Mostafa Rezapour>pip install -exists-action i -upgrade matplotlib
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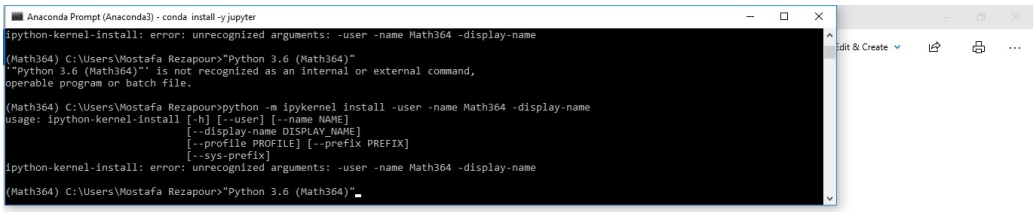

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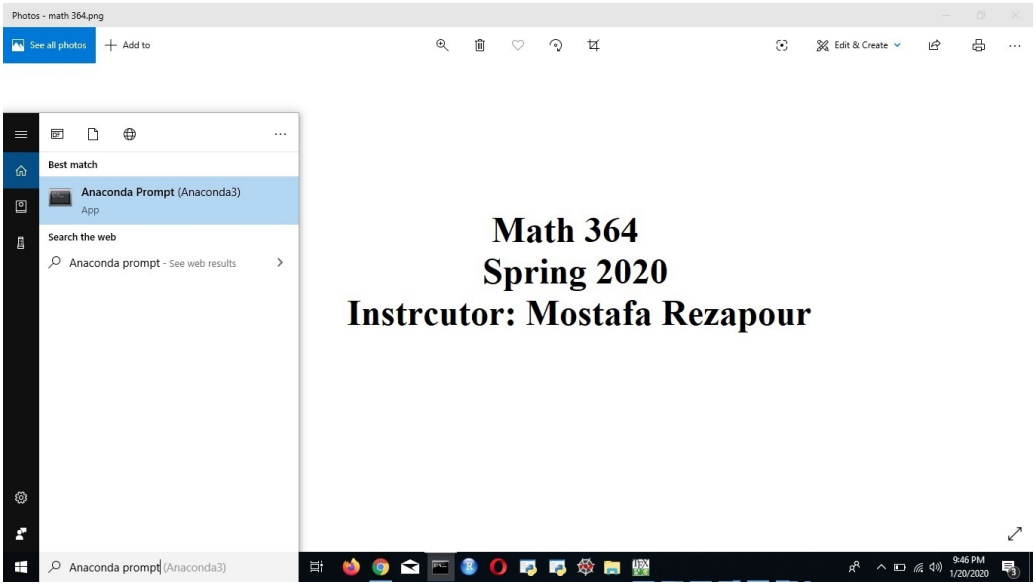

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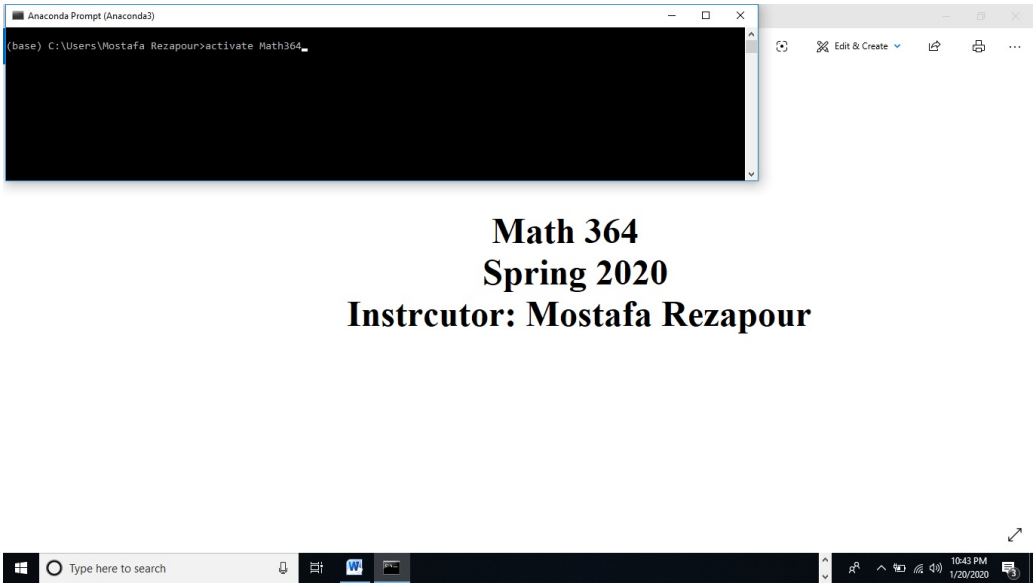
Anaconda Prompt (Anaconda3)
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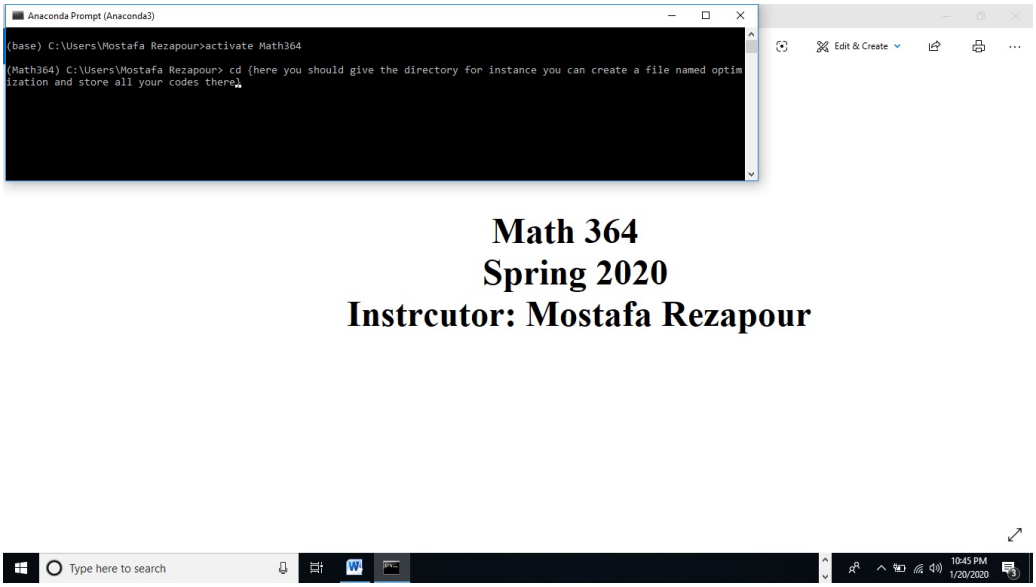
Anaconda Prompt (Anaconda3)
(base) C:\Users\Mostafa Rezapour>activate Math364
(Math364) C:\Users\Mostafa Rezapour> cd {here you should give the directory for instance you can create a file named optim
ization and store all your codes there}
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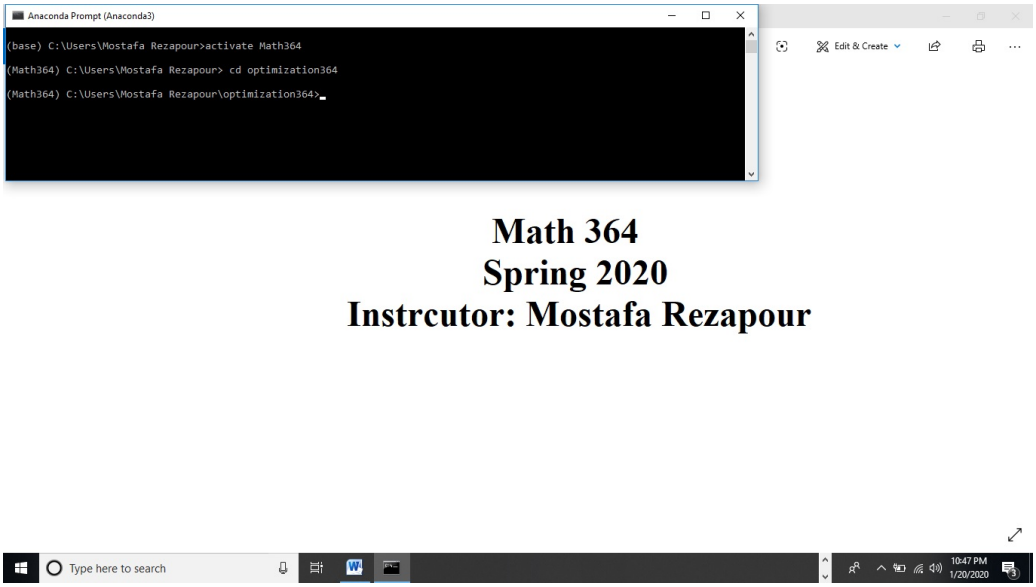
Anaconda Prompt (Anaconda3)
(base) C:\Users\Mostafa Rezapour>activate Math364
(Math364) C:\Users\Mostafa Rezapour> cd optimization364
(Math364) C:\Users\Mostafa Rezapour\optimization364>
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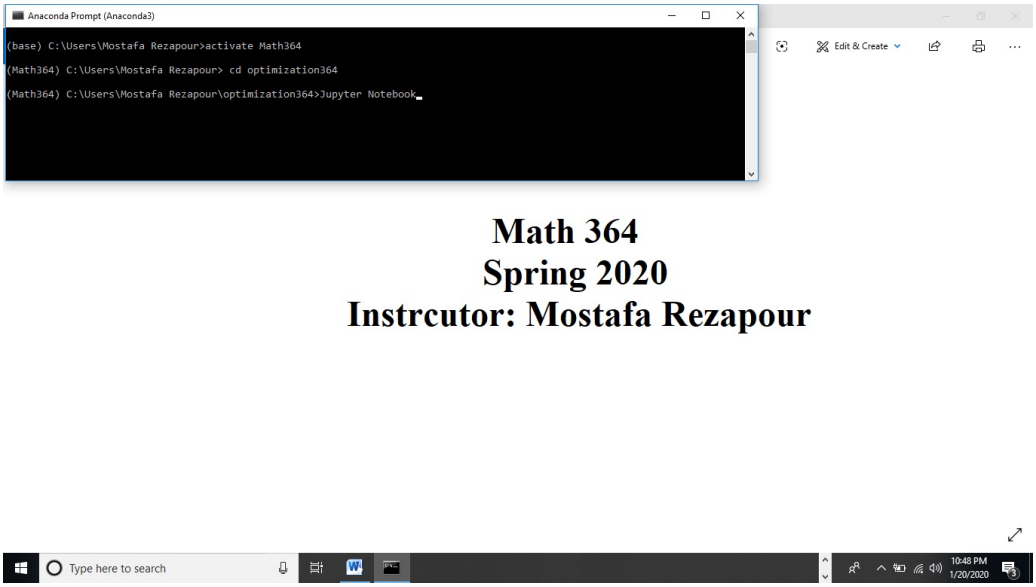
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(base) C:\Users\Mostafa Rezapour>activate Math364
(Math364) C:\Users\Mostafa Rezapour> cd optimization364
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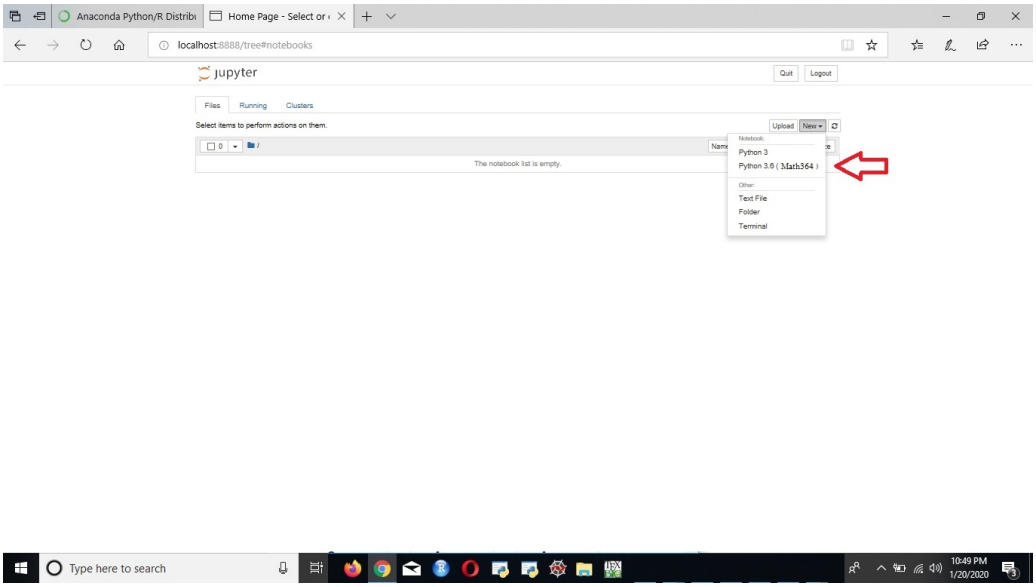
Anaconda Python/R Distribu
Home Page - Select or
localhost:8888/tree#notebooks
jupyter
Quit
Logout
Files
Running
Clusters
Select items to perform actions on them.
Upload
New
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Notebook:
Python 3
Python 3.6 (Math364)
Other:
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Terminal
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