Middle Tennessee State University

Department of Computer Science

CSCI-3080 Discrete Structure

OLA6: Graphs and Algorithms

Instructor: Dr. Xin Yang

Due date: April 25th, 2022 (23:59 PM)

April 15, 2022

1. Download and Install Anaconda

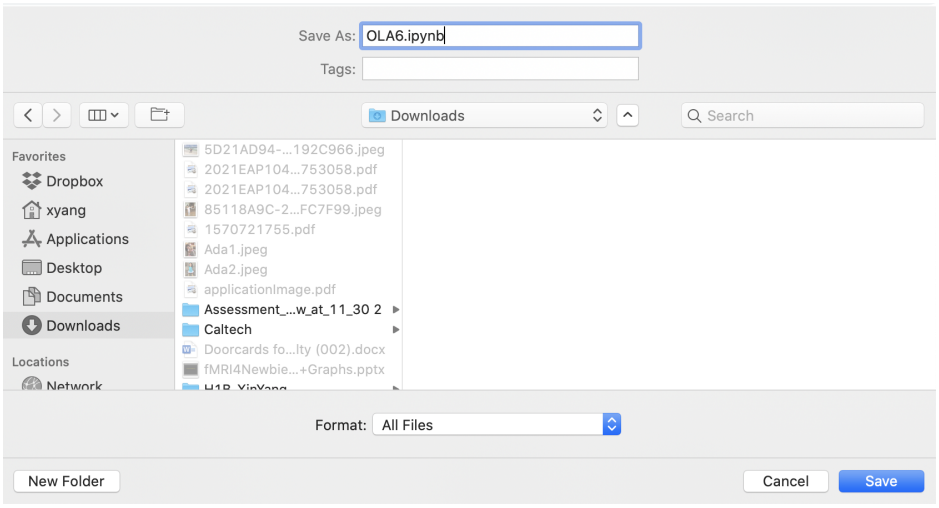
Windows users: `https://docs.anaconda.com/anaconda/install/windows/`
Mac users: `https://docs.anaconda.com/anaconda/install/mac-os/`
Linux users: `https://docs.anaconda.com/anaconda/install/linux/`

Figure 1: Anaconda: Data Science Platform

2. Download the Starter Jupyter Notebook

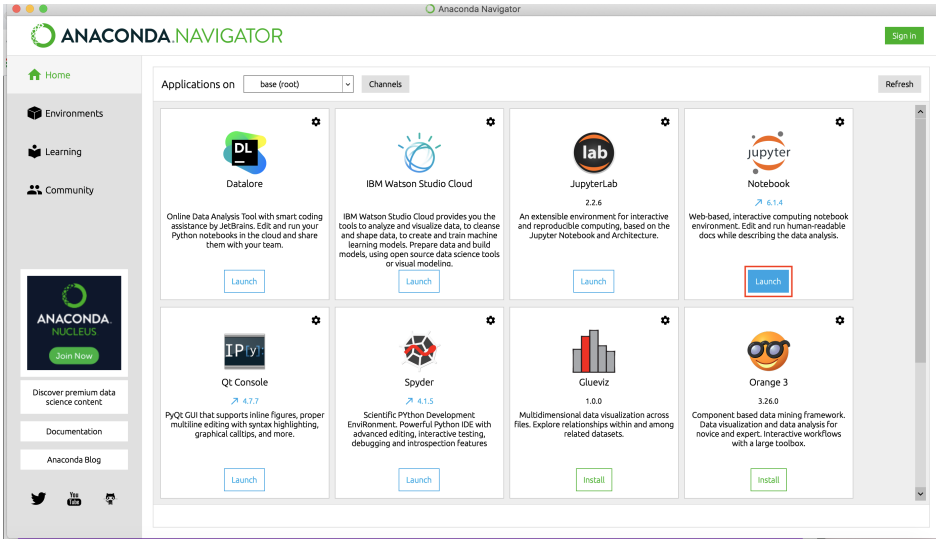
Please download the starter Jupyter Notebook (OLA6.ipynb) from my course calendar:
`https://www.cs.mtsu.edu/~xyang/3080/OLA/OLA6_new.ipynb`

- **Right click** the page.
- Click: "**Save As**"
- Select Format: **All Files**
- **Remove** the extension **.txt**.



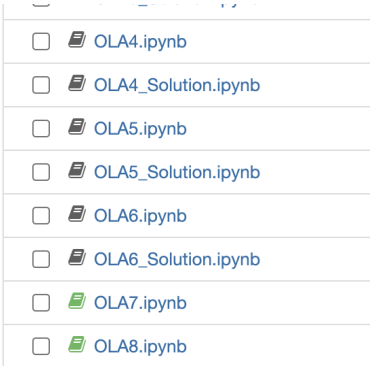
3. Launch Jupyter Notebook

(1) Open Anaconda.
(2) Launch Jupyter Notebook through Anaconda.



4. Open Jupyter Notebook OLA6

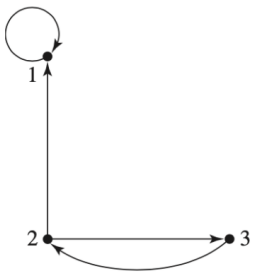
(1) Locate OLA6.ipynb in your Download Folder.



(2) You should see the following page after you click OLA8.ipynb :

n [7]:
```
### CSCI-3080 Discrete Structure
### OLA 8: Chapter 7 -- Graphs and Algorithms
### Name:
### Student ID:
### Date:
```

1. Find the adjacency matrix and adjacency relation (binary relation) for the following graph.



n [ ]:

2. Find the corresponding directed graph and adjacency relation (binary relation) for the followir matrix.

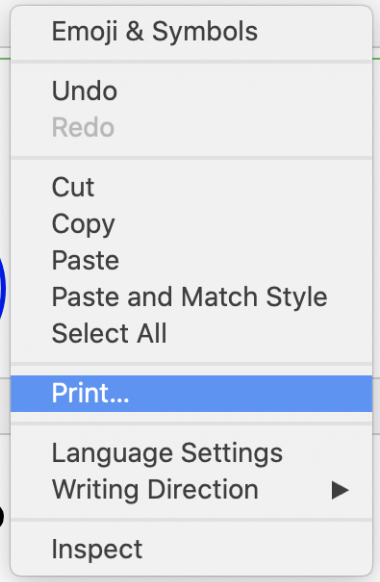
$$\mathbf{A} = \begin{bmatrix} 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

(3) Please fill in your Name, ID, and Date.
(4) Please finish all 10 exercises in Jupyter Notebook.

4. Save OLA6 as a PDF

(1) Please save your OLA6 as a PDF after you finish all the exercises. Please **right click** the Jupyter Notebook, then click **Print**, and **save as PDF**.

[2]:
```
### CSCI-3080 Discrete Structure
### OLA 6: Chapter 5 -- Matrices
### Name:
### Student ID:
### Date:
```



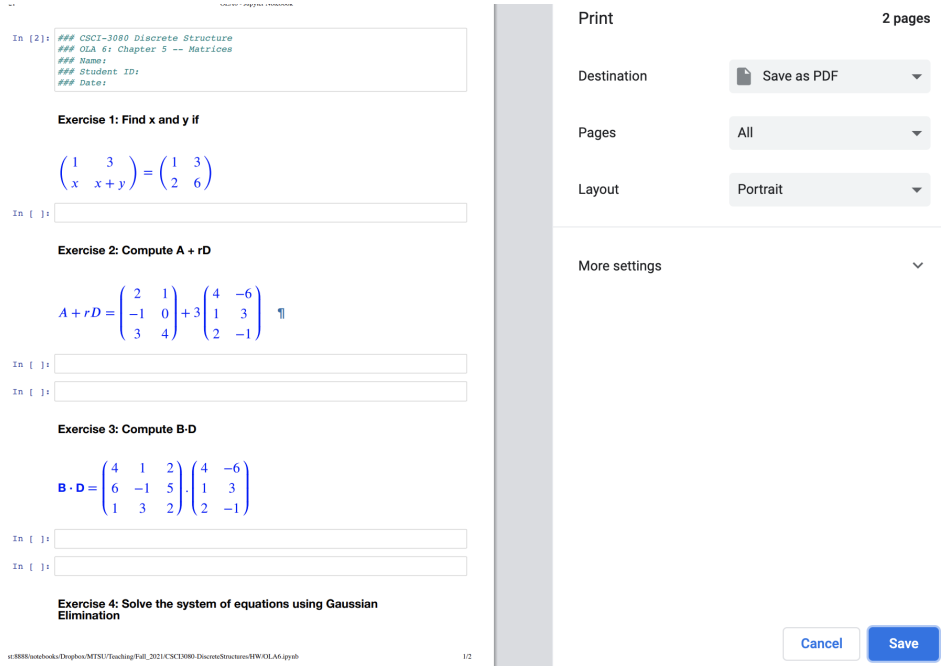
Exercise 1: Find x and y if

$$\begin{pmatrix} 1 & 3 \\ x & x+y \end{pmatrix} = \begin{pmatrix} 1 & 3 \\ 2 & 6 \end{pmatrix}$$

[ ]:

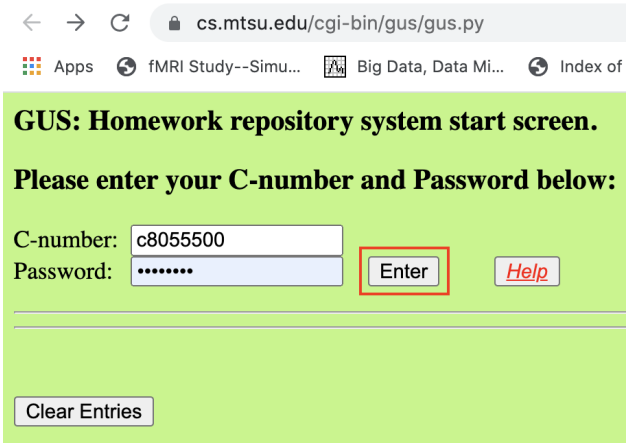
Exercise 2: Compute A + rD

$$\begin{pmatrix} 2 & 1 \end{pmatrix} \quad \begin{pmatrix} 4 & -6 \end{pmatrix}$$



5. Submission

1. log in the gus sytem using your **cNumber** and **Password**:
`https://www.cs.mtsu.edu/cgi-bin/gus/gus.py`

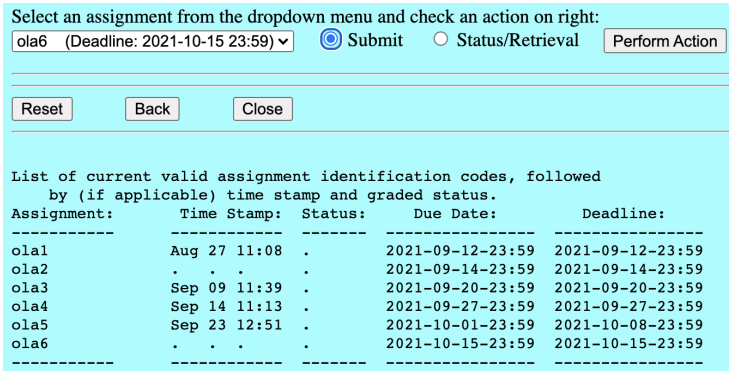


2.

(a) Select **ola6** from the drop-down menu.

(b) Click **Submit**

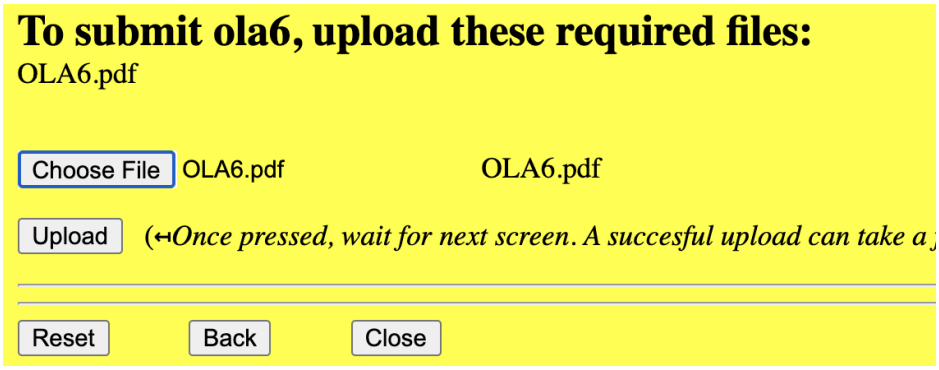
(c) Click **Perform Action**



3.

(a) click **Choose File** to attach your OLA6.pdf

(b) click **Upload**.



4. Congratulations! You are done with OLA6!