

MIDDLE TENNESSEE STATE UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

CSCI-3080 DISCRETE STRUCTURE

OLA5: Recursion, Recurrence Relations

Instructor: Dr. Xin Yang

Due date: Oct 1st, 2021 (23:59 PM)

September 23, 2021



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/>



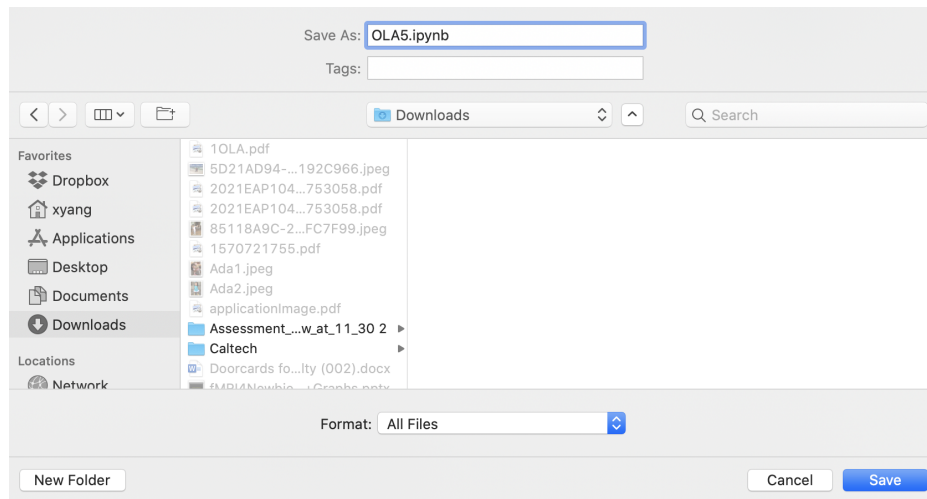
Figure 1: Anaconda: Data Science Platform

2. Download the Starter Jupyter Notebook

Please download the starter Jupyter Notebook (OLA5.ipynb) from my course calendar:

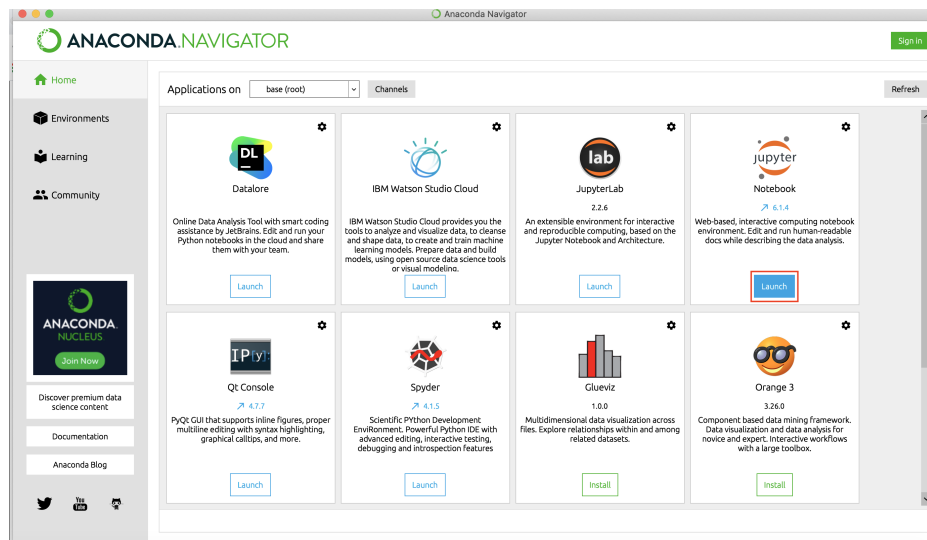
<https://www.cs.mtsu.edu/~xyang/3080/OLA/OLA5.ipynb>

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



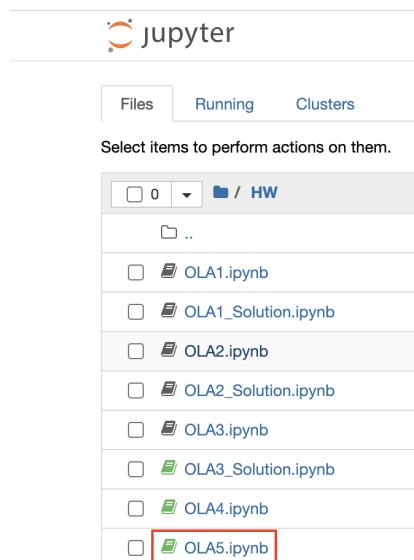
3. Launch Jupyter Notebook

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



4. Open Jupyter Notebook OLA5

(1) Locate OLA5.ipynb in your Download Folder.



(2) You should see the following page after you click OLA5.ipynb :

jupyter OLA5 (autosaved)

File Edit View Insert Cell Kernel Widgets Help

Save Add Undo Redo Run Stop Restart Code

```
In [3]: ### CSCI-3080 Discrete Structure
### OLA 5: Chapter 3 -- Recursive Definitions, Recurrence Relations
### Name:
### Student ID:
### Date:
```

Exercise 1: Write the first 5 values in the sequence:

$$C(1) = 5$$
$$C(n) = 2C(n-1) + 5 \text{ for } n > 1$$

In []:

In []:

- (3) Please fill in your Name, ID, and Date.
- (4) Please finish all 6 exercises in Jupyter Notebook.

4. Save OLA5 as a PDF

(1) Please save your OLA5 as a PDF after you finish all the exercises. Please **right click** the Jupyter Notebook,

then click **Print**, and **save as PDF**.

```
In [3]: ### CSCI-3080 Discrete Structure
        ### OLA 5: Chapter 3 -- Recursive Definitions, Rec
        ### Name:
        ### Student ID:
        ### Date:
```

Exercise 1: Write the first 5 values in the sequence

$$C(1) = 5$$
$$C(n) = 2C(n-1) + 1 \text{ for } n > 1$$

In []:

In []:

Back
Forward
Reload

Save As...

Print...

Cast...

Send to D54462XYANG
Create QR code for this Page

Translate to English

View Page Source
Inspect

Exercise 2: Write the first 5 values in the sequence

$$A(1) = 2$$
$$A(n) = nA(n-1) + n \text{ for } n > 1$$

9/21/2021

OLAS - Jupyter Notebook

```

In [3]: ## CSCI-3080 Discrete Structure
        ## OLA 5: Chapter 3 -- Recursive Definitions, Recurrence Relations
        ## Name:
        ## Student ID:
        ## Date:

```

Exercise 1: Write the first 5 values in the sequence:

$$C(1) = 5$$

$$C(n) = 2C(n-1) + 5 \text{ for } n > 1$$

```

In [ ]:
In [ ]:

```

Exercise 2: Write the first 5 values in the sequence:

$$A(1) = 2$$

$$A(n) = nA(n-1) + n \text{ for } n > 1$$

```

In [ ]:
In [ ]:

```

Exercise 3: An amount of \$500 is invested in an account paying 1.2% interest compounded annually (meaning they don't add interest until the end of the year, so the start of the next year you have the money plus interest)

(a) Please write a recursive definition for $P(n)$, the amount in the account at the beginning of the n th year.
(b) After how many years will the account balance exceed \$570? (You can write a python program to calculate)

```

In [ ]:
In [ ]:

```

Exercise 4: Please write the python code of a recursive function to compute the sequence

InOut[888]: notebook/WWWOLAS/approxA. Please write a recurrence relation for the amount in the account at the beginning of year kth. B. Please find the cl... 1/2

Print

2 pages

Destination

Save as PDF

Pages

All

Layout

Portrait

More settings

Cancel

Save

5. Submission

1. log in the gus sytem using your **cNumber** and **Pass-word**:

<https://www.cs.mtsu.edu/cgi-bin/gus/gus.py>

cs.mtsu.edu/cgi-bin/gus/gus.py

Apps fMRI Study--Simu... Big Data, Data Mi... Index of

GUS: Homework repository system start screen.

Please enter your C-number and Password below:

C-number: c8055500

Password: **Enter** *Help*

Clear Entries

2.
 - (a) Select **ola5** from the drop-down menu.
 - (b) Click **Submit**
 - (c) Click **Perform Action**

Action options:

Select an assignment from the dropdown menu and check an action on right:

ola5 (Deadline: 2021-10-08 23:59) ☒ **Submit** ☐ Status/Retrieval **Perform Action**

Reset Back Close

List of current valid assignment identification codes, followed by (if applicable) time stamp and graded status.

Assignment:	Time Stamp:	Status:	Due Date:	Deadline:
ola1	Aug 27 11:08	.	2021-09-12-23:59	2021-09-12-23:59
ola2	.	.	2021-09-14-23:59	2021-09-14-23:59
ola3	Sep 09 11:39	.	2021-09-20-23:59	2021-09-20-23:59
ola4	Sep 14 11:13	.	2021-09-24-23:59	2021-09-24-23:59
ola5	.	.	2021-10-01-23:59	2021-10-08-23:59

3.
 - (a) click **Choose File** to attach your OLA5.pdf
 - (b) click **Upload**.

To submit ola5, upload these required files:

OLA5.pdf

Choose File OLA5.pdf

OLA5.pdf

Upload

(←Once pressed, wait for next screen. A succesful upload can take a.

Reset

Back

Close

4. Congratulations! You are done with OLA5!

Preparing ola5 submission of the following file(s):

/tmp/c8055500/*

The following file(s) were successfully submitted:

OLA5.pdf

Sep 23 12:51 c8055500

99489 bytes

SUCCESS: ola5 submitted.

Check status line above to see if submission was successful.

Back

Close