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Library Instruction Round Table NEWS

From the President

I live in a Midwestern city. So, naturally, I spend a good chunk of the early fall season attempting to prevent the fallen leaf situation in my front yard from spilling over onto the sidewalk, blocking up the street drain, and consequently irking my neighbors. I was out raking and bagging leaves for a couple of hours this past Saturday and did a heckin' good job, if I do say so myself. Nevertheless, when I stepped out my front door on Sunday, there wasn't a shred of evidence indicating I'd done any work the day before. That's a rough feeling, and when it happens repeatedly, it can start to grind you down.

At this point, you likely sense the analogy I'm going to make to our professional endeavors. So, I'll just do that now. Even when we love and believe in the work we do, we can start to question our impact when we don't see immediate or seemingly lasting results. Maybe you just concluded a stellar library instruction session introducing library database resources and a student approaches you afterward with a list of Googled resources asking why they can't access the full text. Or maybe you put a ton of time and effort into leading a training workshop for staff and two days afterward, *no one* seems to have retained what was discussed. At worst, we feel completely demoralized; at best, we feel like we're in a remake of Groundhog Day.

But here's where it's important to remember that you *are* making an impact – and a meaningful one at that – regardless of whether you witness the results firsthand. At the start of this message, I relayed to you some observations from my own perspective, which outlined a mildly infuriating leaf-raking scenario. However, from my neighbor's perspective, that little bit of leaf-raking prevented a flooded yard from a clogged drain during the evening's rainstorm. Likewise, maybe your information literacy instruction didn't quite land in the way you intended, but a student came away from the session with the newly gained confidence to approach librarians for help when needed.

In short, as we start counting down the days until we might enjoy some end-of-year off time, I just wanted to remind you that what you do (for LIRT, for your own communities, for the profession in general) is a big deal to someone. Probably to lots of someones. 😊

Have a great rest of the year and I look forward to kicking off 2023 with all of you!

Becca



Becca Neel
LIRT President

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From the Editor

Hello LIRT friends and colleagues. I'm a bit wistful this season, as this is my last issue of *LIRT News* as editor. I first took over as editor for the June 2017 issue, so I decided it is time to let someone else take the reins and for me to focus on other initiatives. When I think back, 2017 seems like decades ago—I lived in a different state, worked for a different university, and we were all blissfully unaware of the pandemic that would sweep the world a few years later.

Fast-forward five and a half years, and I'm certainly older and perhaps wiser, but one thing I understand better the longer I'm in this profession is how much I do not know. In some ways that can feel overwhelming—I definitely still feel impostor syndrome in certain situations—even with 14+ years of librarianship under my belt. But in a way, I'm glad too. Wouldn't life be boring if we learned all we needed to know early on?

I have truly enjoyed working on the newsletter, and I'm especially grateful to Rachel Mulvihill, our production editor, for working with me these last few years. I am sure I will continue to be involved in LIRT in the years ahead, as I enjoy the friendships I've made through committee work and service, and I believe in LIRT's mission.

I hope the end of 2022 is good to you, and that 2023 shapes up to be even better.

Sherri



Sherri Brown
LIRT News Editor

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[@LIRT_ALA](#) / Twitter

Editor:
Sherri Brown
Librarian for English
University of Virginia Library
102 Kerchof Hall
PO Box 400137
141 Cabell Drive
Charlottesville, VA 22904
Phone: 434-243-2104
Email: sherri.brown@virginia.edu



Contributions to be considered for the **March 2023 issue** must be sent to the editor by **February 1, 2023**.

Production editor: Rachel Mulvihill
University of Central Florida Libraries

Member A-LIRT

Stan Trembach

Assistant Professor,
School of Library and Information Management,
Emporia State University



What brought you to LIRT?

As I was finishing up my doctoral program at the University of South Carolina, I was looking for a more permanent “home” within ALA. LIRT was an obvious choice, considering my background in education, academic librarianship, and instruction. Our profession—and the larger field of Library and Information Science—is evolving so fast that it is hard to stay abreast of all the major trends and developments unless you make a concerted effort to become a part of this community. What I've enjoyed most about LIRT is the opportunity it provides to connect with colleagues nationally and internationally and make an impact through service on one of its many committees.

What was your path to librarianship?

In many ways, it's a traditional one. I have always been drawn to books and learning. Growing up in a small rural community, books provided a window into the world for me, and I've always wanted to share my fascination with the discoveries I made with others. I carried this passion all the way through college. As an Education and then History major, I met some incredibly helpful and compassionate librarians who turned out to be amazing people as well. So, the decision to get my MLS and then PhD in library science was a no-brainer for me.

Tell us about your current position. What do you like most about it?

I am currently on the faculty of the School of Library and Information Management at Emporia State University. I truly enjoy the daily interactions with the incredibly bright and committed students from all over the country we have in our program. Teaching is an opportunity for me to learn from their vast experiences and worldviews.

In what ways does it challenge you?

The greatest challenge and the adjustment I've had to make since starting in my position in fall 2020 has been the transition of our program from hybrid to a fully online delivery mode. Having to maintain classroom presence without regular face-to-face interaction is challenging, but at the same time it requires that you think about your craft in new and creative ways.

Throughout all of your educational experiences, what teacher inspired you the most and why?

This is a difficult one because it's like having to pick a favorite child. Of the many people that helped shape me into the library professional and educator I am today, I would be remiss if I didn't mention Dr. Steven Marks and Ms. Cathy Sturkie, who taught me many professional and life lessons as well.

When you travel, what do you never leave home without?

At this day and age that requires you to be “on” 24/7 and have information at your fingertips, I would say it's my phone.

Member A-LIRT, continued

Stan Trembach

If you could change one thing about libraries today, what would it be?

It may sound idealistic, but I do believe that libraries have untapped potential to change the world for the better. A lot of this transformative work is already happening, but I think libraries could do more to bring communities together and become places of unity and learning for all.

Tell us one thing about yourself that most of us probably don't know.

I can read about three times as many languages as I can speak.

What do you like about LIRT and what would you like to see?

I like how visible LIRT is within ALA. I like the support and encouragement members get from the leadership to run exciting programming both for the Annual Conference and year-round. I'd like to see more of this work and perhaps collaboration between different committees moving forward.



LIRT Upcoming Events

Lunch & Learn with LIRT

Join your LIRT colleagues for an informal, lunchtime chat on Zoom scheduled for **Friday, February 10, 2023 at 1pm Eastern Time.**

February's topic relates to source evaluation strategies. What tools do you use to teach how to evaluate sources? Some popular tools include TRAAP, SIFT, CARS, and more. Bring your favorite to discuss with colleagues. There will be no formal presentation during this session; only informal discussion, networking, and prizes!

Up to three lucky attendees will receive a \$10 gift card during a random drawing.

Registration will be capped at 25 attendees, so sign up soon. Attendance is not limited to LIRT members.

Register at <https://ucf.zoom.us/meeting/register/tJIpf-CtpjkoHdBpAxqoKpHKJs6e7d5SwUp>



LIRT Annual Conference President's Program 2023

Universal Design for Learning - Planning for All Learners

Universal design for learning is an educational framework that optimizes teaching to accommodate all learners through multiple means of representation, expression, and action & engagement. By creating accessible, inclusive learning experiences, libraries of all types can provide more equitable library services and support for learners through intentional, proactive, and reflective practices. In this session, participants will learn how librarians from different libraries are incorporating universal design for learning into their instruction, whether in-person and/or online, to help reduce barriers and encourage learning.

Watch the ALA conference website and upcoming *LIRT News* issues for more details about this event planned for ALA Annual in Chicago.

2023

LIRT Librarian Recognition Award

Call for Nominations

We are pleased to invite nominations for the 2023 LIRT Librarian Recognition Award. The Librarian Recognition Award is given in acknowledgement of a practicing librarian's contribution to the development, advancement, and support of information literacy and/or instruction in any type of library. Self-nominations are welcome.

The award will be judged based on the following:

- Contributions to library literature on topics related to instruction/information literacy. These contributions can consist of both formal and informal publications (peer-reviewed articles and book chapters, blog postings, newsletter contributions, etc.). Non-traditional forms of publishing will be considered.
- Key role in the creation of an instruction/information literacy program or project that has shown potential for wide-spread sharing and replication.
- Impactful participation within local, regional, national, and/or international level professional organizations that are devoted to the support and promotion of library instruction and information literacy in any type of library.

Nomination Materials:

To nominate a practicing librarian for the LIRT Librarian Recognition Award, please submit a nomination packet that includes:

- Completed nomination sheet (available on LIRT Awards website)
- Letter from the nominator addressing the award criteria (see rubric on LIRT Awards website), providing concrete examples
- 3 letters of support
- Resume or CV for the individual being nominated
- A brief letter from the nominee acknowledging their consent to be nominated for the award

Other supporting materials that show the individual's contributions to information literacy and instruction are welcome. Electronic submission of nomination materials is expected. Further information regarding the award and the selection process can be found on the LIRT Awards website: <http://www.ala.org/rt/lirt/awards>

Deadline

Send all LIRT Librarian Recognition Award nomination materials **by January 15, 2023** to:

Bridget Farrell
bridget.farrell@du.edu

The award winner will be notified following the ALA LibLearnX Conference, no later than February 15, 2023.

The award will be presented at the 2023 ALA Annual Conference. Award winners will receive a \$1,000 cash award, a plaque, and a \$500 travel stipend to be used toward attending the ALA Annual Conference. Awards are sponsored by the Library Instruction Round Table.

If you have any questions, please contact the LIRT Awards Committee Co-Chair, Wayne Finley (wfinley@niu.edu)

2023

LIRT Innovation in Instruction Award

Call for Nominations

We are pleased to invite nominations for the 2022 LIRT Innovation in Instruction Award. The Innovation in Instruction Award is given in recognition of a library's contributions to the development, advancement, and support of information literacy and/or instruction in any type of library. Self-nominations are welcome.

The award will be given to a library that has done one (or more) of the following:

- Revamped its public instruction program in response to a new technology, an assessment report, etc.
- Initiated a public program that utilizes best practices of instruction in combination with new methods of delivery.
- Created an original type of instruction, e.g., team-taught interdisciplinary research sessions, a novel form of outreach, etc.
- Practice(s) will be prioritized over scholarship with preference for innovative practices that are low-cost and can be easily reproduced elsewhere.

Nomination Materials:

To nominate a library for the LIRT Innovation in Instruction Award, please submit a nomination packet that includes the following:

- Completed nomination sheet (available on LIRT Awards website)
- Letter from the nominator addressing the award criteria (see rubric on LIRT Awards website), providing concrete examples
- 3 letters of support

Other supporting materials that show the library's contributions to information literacy and instruction are encouraged. Only one member of the library nomination group needs to be a librarian. Electronic submission of nomination materials is expected. Further information regarding the award and the selection process can be found on the LIRT Awards website: <http://www.ala.org/rt/lirt/awards>.

Deadline

Send all LIRT Innovation in Instruction Award nomination materials **by January 15, 2023** to:

Wayne Finley
wfinley@niu.edu

The award winner will be notified following the ALA LibLearnX Conference, no later than February 15, 2023.

The award will be presented at the 2023 ALA Annual Conference. Award winners will receive a \$1,000 cash award, a plaque, and a \$500 travel stipend to be used toward attending the ALA Annual Conference. Awards are sponsored by the Library Instruction Round Table.

If you have any questions, please contact the LIRT Awards Committee Co-Chair: Wayne Finley (wfinley@niu.edu)

Join the Journal Club

with the LIRT Adult Learners Committee

By Nan Carmack and Alissa Droog

About the LIRT Adult Education Committee

The LIRT Adult Education committee "is charged with assisting library professionals to understand, find information or promote ideas on learning styles, teaching methods, and training resources most often associated with adult learners" (<https://www.ala.org/rt/lirt/adult-learners-committee>).

The Journal Club

After hearing that many people on the committee were interested in learning more about adult learning theory, Alissa Droog, Assistant Professor, Education & Social Sciences Librarian at Northern Illinois University, suggested that the Adult Education Committee engage in a journal club. Droog referenced Ashleigh Yates-McKay's unpublished work: Journal Club: A How-To Guide (2021) in defining the group:

What is a Journal Club? A journal club is kind of like a book club. A group of people agree to read an article and get together to discuss it. Journal clubs don't have to read articles, but can discuss book chapters, podcast episodes, a video, webinar, etc. The goal of our Journal Club is to develop an evidence-based practice where we discuss and learn from trends and emerging research related to adult learners.

Journal Club Session Structure

- Welcome, agenda, and introductions
- Article Summary (from facilitator)
- Initial question for everyone: what did you think of this resource?
- Discussion questions and discussion
- Conclusion: Confirm next facilitator and journal club date

Role of the Facilitator(s)

- Choose a resource and share with the group 1 month before the next journal club
- Read and prepare a short summary of the resource to share at the beginning of the discussion
- Prepare discussion questions and moderate discussion (Yates-MacKay, 2021)

Last school year, the Adult Education Committee hosted three journal clubs based on the following articles:

Merriam, S. B., & Bierema, L. L. (2013). Andragogy: The art and science of helping adults learn. In *Adult Learning: Linking Theory and Practice* (pp. 42-60). John Wiley & Sons.

Morris, T. H. (2020). Transformative learning through mindfulness: Exploring the mechanism of Change. *Australian Journal of Adult Learning*, 60(1), 44-65.
<http://researchspace.bathspa.ac.uk/13108/1/13108.pdf>

Gilstrap, Donald L. Why do we teach? Adult learning theory in professional standards as a basis for curriculum development. *College & Research Libraries* 74(5), 501-518. <https://doi.org/10.5860/crl12-334>

The participants in the groups ranged from five to eight librarians from across the country, each taking turns as facilitator. The group engaged in discussion, reflection, and generation of ideas for putting the presented research into practice.

Nan Carmack, Ed.D., M.L.S., works with public libraries in Virginia out of the state library and teaches in the MLIS program at Old Dominion University. The journal club provided an opportunity for her to connect with academic librarians as well as engage more thoughtfully with the needs of Adult Learners in terms of her students and the role of accidental educator in public libraries. Carmack comments, "It was refreshing to be intentional in engaging with research with an eye towards practice but even more useful to do so in a group of library professionals. I look forward to every session."

Join us for an upcoming session! Email adroog@niu.edu for information and dates.

Tech Talk

By Billie Peterson-Lugo, Baylor University

billie.peterson@baylor.edu

Dear Tech Talk— In your column about *Collections as Data* (June 2022), you mentioned *Jupyter Notebooks*. These sound intriguing, and I'd like to know more. **Just Nudging on Jupyter Notebooks**

Dear JNJJN— Let me begin by saying that I can provide a high overview of Jupyter Notebooks, but it is beyond the scope of this column to provide detailed information on how to use Jupyter Notebooks, which will become clearer as you learn more about them.

Jupyter Notebooks (among other tools) address a concept proposed by Knuth (1992)—literate programming—the ability to write code in such a way that it is understood by both humans and machines. To this end, a Jupyter Notebook is a web-based tool that Johnson (2020) describes as follows: “The Jupyter notebook provides an interactive, iterative environment in which users can create documents that combine formatted natural language, executable code, and multimedia. This results in a rich interactive computer experience that is difficult to replicate with other tools” (p. 32). Jupyter Notebooks evolved from IPython Notebooks in 2014, with the development of Project Jupyter (<https://jupyter.org>). The origin of the name Jupyter allegedly evolved from the names of 3 programming languages: *Julia*, *Python*, and *R* (“Project Jupyter,” 2022).

What is meant by an *interactive, iterative environment*? Jupyter Notebooks provide a WYSIWYG interface that provides individual cells—some for narrative text and some for code snippets—that users can write in and run directly in the Jupyter Notebook.

A notebook is composed of *cells*, which can be of three types: code, markdown, and raw. A *code* cell contains executable code used to produce results. A *markdown* cell contains formatted text. Finally, a *raw* cell contains text that is neither code nor formatted text. Tools that convert notebooks into other formats use raw cells for configuration. (Pimentel et al., 2019, p. 508)

Users interact directly with the *code* cells and the *markdown* cells.

In order for the execution of the code snippets, Jupyter Notebooks use *kernels* to run the code in each cell and provide the output. *Kernels* are specific programming environments selected by the user for the specific notebook. Most often, Python is used (because of the Python-based origin of Project Jupyter); however, hundreds of kernels are available, such as C++, JavaScript, Perl, R, Ruby, etc. (<https://github.com/jupyter/jupyter/wiki/Jupyter-kernels>)

Markdown is a markup language that enables the use of rich text (headings, bold, italicized, lists, etc.) like HTML, except not as complex. Markup cells provide context for the code cells with which they are intermingled. Some examples of Markdown are:

- Headings – use 1 or more # symbols (up to 6), e.g.,
Heading = **Heading 1**;
Heading = **Heading 2**;
Heading = **Heading 3**
- Italics – use a single *, e.g., **italics** = *italics*
- Bold – use a double *, e.g., ****bold**** = **bold**
- Bold & Italicized – use three *, e.g., *****bold & italicized***** = ***bold & italicized***

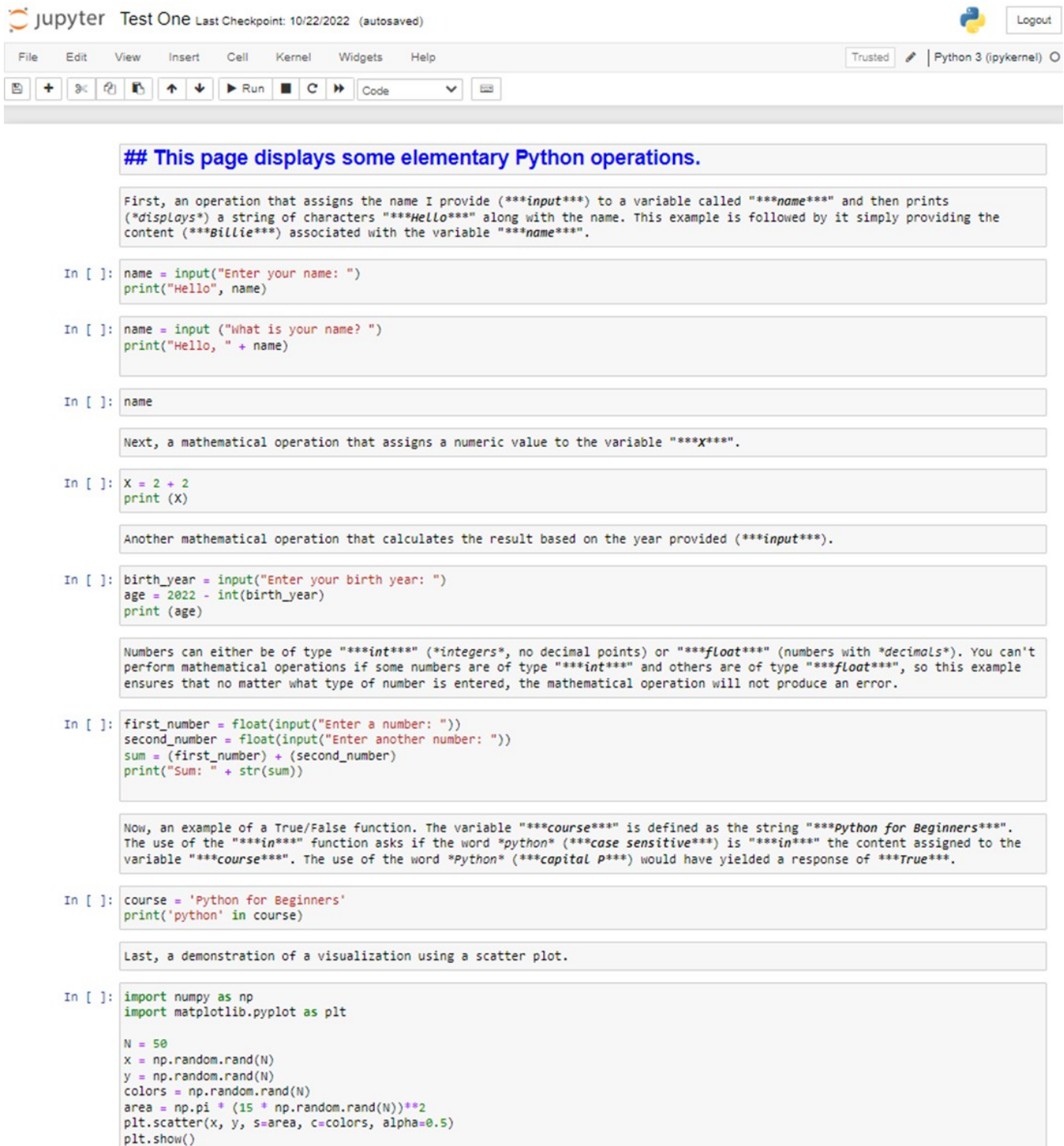
A review of the *Markdown Cheat Sheet* (<https://www.markdownguide.org/cheat-sheet/>) available from the *Markdown Guide* (Anonymous, 2022b) provides enough information to get started using the Markdown.

Last—the *raw* cells. These cells (which run behind the scenes) enable the sharing of Jupyter Notebooks. Although live Jupyter Notebooks can (and should) be shared through resources like GitHub, they can also be shared by converting them to static PDFs or HTML or LaTeX files. The ability to convert a Jupyter Notebook to one of these files provides

Tech Talk, continued

others with the option of reading them and providing feedback without having to run them in a Jupyter environment. Also, this practice eliminates security risks associated with executing unfamiliar code.

To provide better context for the information above, watch this screencast: <https://www.screencast.com/t/nVIAW0lh>. **Note:** I am not a programmer; these are very simple Python operations, except for the last example, which is generic code that I copied from another source. In this example, I chose the *run all* option. I could have placed my cursor in each cell (both Markup and code cells) and run each cell individually. Additionally, the following images show this notebook prior to execution and after execution. Take note of the Markdown text that displays before each cell is executed, as well as the resulting action from the code cells.



The screenshot shows a Jupyter Notebook titled "Test One" with a last checkpoint of 10/22/2022. The interface includes a menu bar (File, Edit, View, Insert, Cell, Kernel, Widgets, Help) and a toolbar with icons for file operations, running, and cell management. The notebook contains several cells:

- Markdown Cell:** A blue header text: `## This page displays some elementary Python operations.`
- Text Cell:** A paragraph explaining the first operation: "First, an operation that assigns the name I provide (***input***) to a variable called '***name***' and then prints (*displays*) a string of characters '***Hello***' along with the name. This example is followed by it simply providing the content (***Billie***) associated with the variable '***name***'."
- Code Cell:**

```
In [ ]: name = input("Enter your name: ")
        print("Hello", name)
```
- Code Cell:**

```
In [ ]: name = input("What is your name? ")
        print("Hello, " + name)
```
- Code Cell:**

```
In [ ]: name
```
- Text Cell:** A paragraph explaining the next operation: "Next, a mathematical operation that assigns a numeric value to the variable '***x***'."
- Code Cell:**

```
In [ ]: x = 2 + 2
        print(x)
```
- Text Cell:** A paragraph explaining another mathematical operation: "Another mathematical operation that calculates the result based on the year provided (***input***)"
- Code Cell:**

```
In [ ]: birth_year = input("Enter your birth year: ")
        age = 2022 - int(birth_year)
        print(age)
```
- Text Cell:** A paragraph explaining a mathematical operation with different data types: "Numbers can either be of type '***int***' (*integers*, no decimal points) or '***float***' (numbers with *decimals*). You can't perform mathematical operations if some numbers are of type '***int***' and others are of type '***float***', so this example ensures that no matter what type of number is entered, the mathematical operation will not produce an error."
- Code Cell:**

```
In [ ]: first_number = float(input("Enter a number: "))
        second_number = float(input("Enter another number: "))
        sum = (first_number) + (second_number)
        print("Sum: " + str(sum))
```
- Text Cell:** A paragraph explaining a True/False function: "Now, an example of a True/False function. The variable '***course***' is defined as the string '***python for Beginners***'. The use of the '***in***' function asks if the word *python* (***case sensitive***) is '***in***' the content assigned to the variable '***course***'. The use of the word *Python* (***capital P***) would have yielded a response of ***True***."
- Code Cell:**

```
In [ ]: course = 'Python for Beginners'
        print('python' in course)
```
- Text Cell:** A paragraph explaining a visualization: "Last, a demonstration of a visualization using a scatter plot."
- Code Cell:**

```
In [ ]: import numpy as np
        import matplotlib.pyplot as plt

        N = 50
        x = np.random.rand(N)
        y = np.random.rand(N)
        colors = np.random.rand(N)
        area = np.pi * (15 * np.random.rand(N))**2
        plt.scatter(x, y, s=area, c=colors, alpha=0.5)
        plt.show()
```

Figure 1 Jupyter Notebook with Code Before Execution

Tech Talk, continued



The screenshot shows a Jupyter Notebook titled "Test One" with a last checkpoint of 10/22/2022. The interface includes a menu bar (File, Edit, View, Insert, Cell, Kernel, Widgets, Help) and a toolbar with icons for file operations, running, and code execution. The notebook content is as follows:

This page displays some elementary Python operations.

First, an operation that assigns the name I provide (*input*) to a variable called "*name*" and then prints (*displays*) a string of characters "*Hello*" along with the name. This example is followed by it simply providing the content (*Billie*) associated with the variable "*name*".

```
In [1]: name = input("Enter your name: ")
print("Hello", name)

Enter your name: Billie
Hello Billie
```

```
In [2]: name = input("What is your name? ")
print("Hello, " + name)

What is your name? Billie
Hello, Billie
```

```
In [3]: name

Out[3]: 'Billie'
```

Next, a mathematical operation that assigns a numeric value to the variable "*X*".

```
In [4]: X = 2 + 2
print(X)

4
```

Another mathematical operation that calculates the result based on the year provided (*input*).

```
In [5]: birth_year = input("Enter your birth year: ")
age = 2022 - int(birth_year)
print(age)

Enter your birth year: 1978
44
```

Numbers can either be of type "*int*" (*integers*, no decimal points) or "*float*" (*numbers with decimals*). You can't perform mathematical operations if some numbers are of type "*int*" and others are of type "*float*", so this example ensures that no matter what type of number is entered, the mathematical operation will not produce an error.

```
In [6]: first_number = float(input("Enter a number: "))
second_number = float(input("Enter another number: "))
sum = (first_number) + (second_number)
print("Sum: " + str(sum))

Enter a number: 56.9
Enter another number: 43
Sum: 99.9
```

Now, an example of a True/False function. The variable "*course*" is defined as the string "*Python for Beginners*". The use of the "*in*" function asks if the word *python* (*case sensitive*) is "*in*" the content assigned to the variable "*course*". The use of the word *Python* (*capital P*) would have yielded a response of *True*.

```
In [7]: course = 'Python for Beginners'
print('python' in course)

False
```

Last, a demonstration of a visualization using a scatter plot.

```
In [8]: import numpy as np
import matplotlib.pyplot as plt

N = 50
x = np.random.rand(N)
y = np.random.rand(N)
colors = np.random.rand(N)
area = np.pi * (15 * np.random.rand(N))**2
plt.scatter(x, y, s=area, c=colors, alpha=0.5)
plt.show()
```

Figure 2 Jupyter Notebook after Code Executed (continued on next page)

Tech Talk, continued

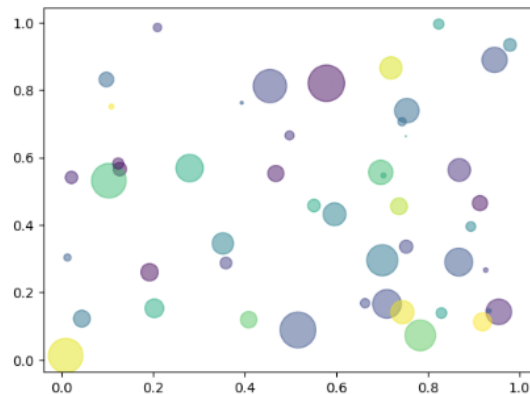


Figure 2, continued, Jupyter Notebook after Code executed

Who uses Jupyter Notebooks? Not surprisingly, Jupyter Notebooks are used by anyone who works extensively with data—data scientists across all disciplines—sciences, social sciences, even the humanities. Jupyter Notebooks enable them to provide the *story* of their research in ways that haven’t been viable before. A recent search in *PubMed Central* demonstrates the significant uptake in the use of Jupyter Notebooks in scientific research, as illustrated in the graph below, a total of 4,099 citations since 2015, with growth doubling from year to year until recently.

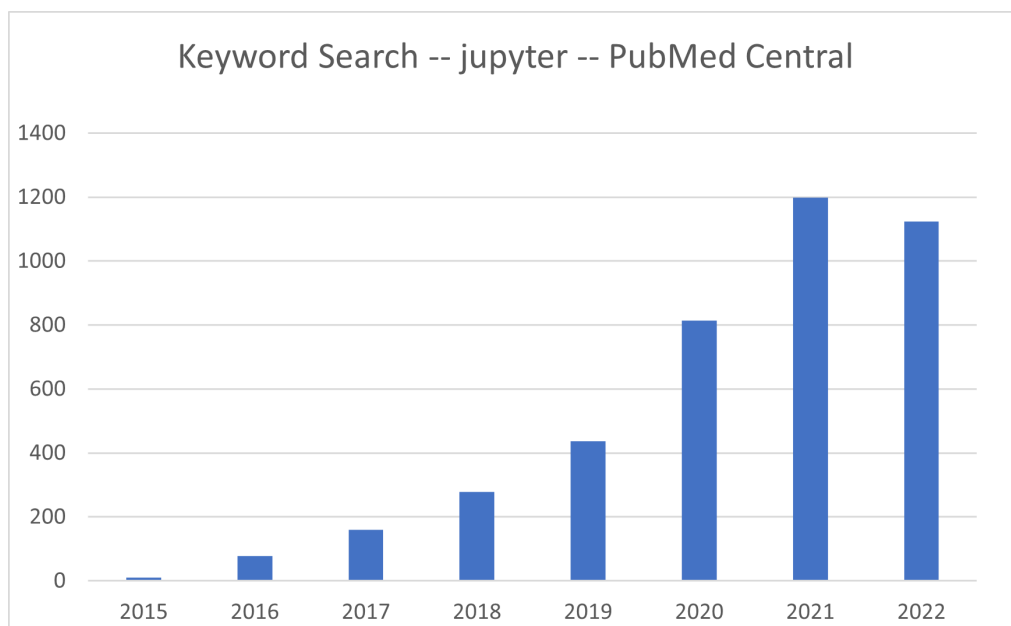


Table 1 Keyword Search for jupyter performed in PubMed Central November 6, 2022

Tech Talk, continued

Another indicator of the rapid growth of Jupyter Notebooks, “In 2015, about 200,000 Jupyter notebooks were available on GitHub. By 2018, about 2.5 million were available. In January 2021, nearly 10 million were available” (“Project Jupyter,” 2022).

Because Jupyter Notebooks so easily enable literate programming, data scientists find them helpful for providing detailed information on how they process their data, sharing that information with others, and, ideally, designing notebooks so the research is reproducible and/or others can build on the research to discover other research outcomes.

In fact, some tout the value of Jupyter Notebooks for their ability to support reproducible research and open science (Beg et al., 2021; Kluyver, 2016). However, others (Schröder, Krüger, & Spors 2019; Pimentel, 2019; and Pimentel, 2021) have performed research on Jupyter Notebooks to find evidence for or against reproducibility. Their research has demonstrated that while the potential for reproducibility is there, to a large extent that potential has not yet been achieved with most notebooks. Cheng & Kovalevski (2019), Haitz (2019), Pimentel (2019), and Rule et al. (2019) have provided best practices or recommendations to ensure that Jupyter Notebooks are set up in such a way that they enable the best level of sharing as well as reproducibility of the research.

However, the wrangling of data is not the only way individuals use Jupyter Notebooks. An increasing number of instructors use Jupyter Notebooks—not just those who teach computer science but those who teach in other disciplines, including bioscience and informatics, mathematics, and political science; see: Davies et al. (2020); Duda et al. (2021); Giacomello & Preka (2020); Ishihara (2020); Johnson (2020); Kim & Henke (2021); Koehler & Kim (2018); Lasser et al. (2020); and Ruiz-Sarmiento, Baltanas, & Gonzalez-Jimez (2021)—which is only a representative sample of articles available. In the introduction of their book *Teaching and Learning with Jupyter*, Barba et al. (2019) write, “This handbook is for any educator teaching a topic that includes data analysis or computation in order to support learning. It is not just for educators teaching courses in engineering or science, but also data journalism, business and quantitative economics, data-based decision sciences and policy, quantitative health sciences, and digital humanities.”

Jupyter Notebooks enable an active classroom as well as flipped learning and can help graduate students outside the computer science field learn programming so they can become effective data scientists in their disciplines. Jupyter Notebooks, by their very nature, encourage experimentation with code and data. Learners can write code in individual code cells, run the code, examine the output, re-write the code to see the output from a different perspective, and make notes on each iteration using Markdown cells. Instructors can use Jupyter Notebooks in class to run code live, ask questions, or ask for techniques for changing the code, performing changes live in the classroom. Additionally, instructors can set up Jupyter Notebooks in such a way that they become both a textbook and a source of assignments through the provision of partially completed problems students complete and turn in. After completion, instructors could address them in the classroom, once again, live and interactively.

At this point in time, there is very little in the literature that discusses how librarians use Jupyter Notebooks. Chudnov (2016a) discusses how he values and uses Jupyter Notebooks daily—both in his work and for instruction; Ames & Havens (2022) and Havens (2020) discuss the use of Jupyter Notebooks with collections as data at the National Library of Scotland; and Davis (2020) discusses the use of Python (with some reference to Jupyter Notebooks) for authority control. Beyond that, much of the work librarians do with Jupyter Notebooks falls into the realm of digital scholarship services provided by the library, such as providing workshops or tutorials, for example: <https://tinyurl.com/yss78uss> or <https://guides.wpunj.edu/jupyter>. However, reading the articles that talk about Jupyter Notebooks in the context of reproducibility of research, its value for open science, and the value of best practices in using Jupyter Notebooks—along with the National Library of Scotland’s use of Jupyter Notebooks with collections of data—indicates that Jupyter Notebooks do hold a place for librarians to explore and implement services that support researchers’ needs (depending on how deep into the weeds of Python programming they want to go).

The best way to explore is to jump in and experiment with Jupyter Notebooks. Although you can download and install it directly from the Jupyter site (<https://jupyter.org>), some easier options are available:

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- Anaconda (<https://www.anaconda.com/>) – The option most often recommended; it does require installing Anaconda on a local computer and provides more than is needed, but the upside is that it contains Jupyter Notebooks and many of the libraries used by Jupyter Notebooks.
- Constellate (<https://constellate.org/>) – Provided by the not-for-profit ITHAKA, this environment uses Jupyter Notebooks to perform digital humanities research using JSTOR content. Constellate offers both a freely open basic package and a subscription-based package (<https://constellate.org/docs/library-participation>).
- Google Colab (<https://colab.research.google.com/>) – Similar to other Google Docs, this is “an executable document that lets you write, run, and share code within Google Drive. . . a Jupyter notebook stored in Google Drive” (Vanderplas 2019).
- Kaggle (<https://www.kaggle.com/>) – Acquired by Google in 2017 (Kaggle 2022), it is “a no-setup, customizable, Jupyter Notebooks environment [with]. . . a huge repository of community published data & code” (<https://kaggle.com>).

So, there’s no way around it—to use Jupyter Notebooks, you do need to learn Python – even if you just want to tinker a bit and no more. Below are some resources to get started:

- Constellate Tutorials (<https://constellate.org/tutorials>)
- Getting Started with Jupyter Notebooks (<https://constellate.org/tutorials/getting-started-with-jupyter>)
- Introduction to Python Jupyter Notebooks using Google Colab (<https://tinyurl.com/yss78uss>)
- *Introduction to Machine Learning and Python* (Belyadi & Haghighat, 2021)
- *Jupyter Notebook Tutorial: Introduction, Setup, and Walkthrough* (Schafer, 2016)
- Kaggle Learn (<https://www.kaggle.com/learn>)
- Kaggle Python (<https://www.kaggle.com/learn/python>)
- LinkedIn Learning (<https://www.linkedin.com/learning/>) requires a LinkedIn Learning account
- *Python for Beginners -- Learn Python in 1 Hour* (Hamedani 2020)

Last, a few other concepts or resources to be familiar with:

- Binder (<https://mybinder.org>) – By pointing to the repository (GitHub, for example) that holds a Jupyter Notebook, this service enables opening of the notebook in an executable environment, making the code immediately reproducible.
- DataFrame – “a 2-dimensional labeled data structure with columns of potentially different types, comparable to a spreadsheet or SQL table. It is generally the most commonly used pandas object” (https://pandas.pydata.org/pandas-docs/stable/user_guide/dsintro.html).
- IDE (Integrated Development Environment) – “software for building applications that combines common developer tools into a single graphical user interface” (<https://www.redhat.com/en/topics/middleware/what-is-ide>). Jupyter Notebooks are an IDE.
- JupyterHub (<https://jupyter.org>) – “a multi-user server for Jupyter Notebooks. It is designed to support many users by spawning, managing, and proxying many singular Jupyter Notebook servers” (“Project Jupyter,” 2022).
- JupyterLab (<https://jupyter.org>) – “a newer user interface for Project Jupyter, offering a flexible user interface and more features than the classic notebook UI” (“Project Jupyter,” 2022).
- Jupyter Notebook Collections (<https://gist.github.com/ocoyawale/54d92fd4bf92508a2a6e482b5fa480fd>) – Jupyter Notebooks available on GitHub.
- NBViewer (<https://nbviewer.org/>) – A function that renders a Jupyter notebook as a HTML document that displays the content of the notebook without the interactive component.
- NBGrader (<https://nbgrader.readthedocs.io/>) – facilitates creating and grading assignments in Jupyter Notebooks.
- Popular Libraries in Python/Jupyter Notebooks

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- Matplotlib (<https://matplotlib.org/>) – According to Scott (2021), a 2D plotting library that provides easy-to-use visualization and is downloaded about 1 million times/day (p. 26).
- NumPy (<https://numpy.org/>) – Enables the use of arrays for data manipulation. According to Scott (2021) it's the "most foundational library in Python. Nearly every Python library solving a scientific related problems builds on top of NumPy. It provides the base data structures and computing tools to enable developers." It's downloaded about 3 million times per day (p. 26).
- pandas (<https://pandas.pydata.org/>) – Provides a set of tools to do data analysis – enables loading, preparing, manipulating, modeling, and analyzing data; also enables joining data, merging data, reshaping data, and taking data from different databases, putting it together, and analyzing it (McMullen, 2018). According to Scott (2021), it's downloaded about 3 million times/day (p. 26).

With this background in place, hopefully you will have a general understanding of Jupyter Notebooks, who uses them, and how you might go about learning more – if desired.

Additional Resources

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This committee shall be responsible for annual program preparation and presentation.

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This committee shall initiate and maintain communication with groups within the American Library Association dealing with issues relevant to library instruction and shall disseminate information about these groups' activities.

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Library Instruction Round Table News

c/o Danielle M. Ponton
American Library Association
225 N. Michigan Ave., 13th Floor
Chicago, IL 60601
dponton@ala.org
800.545.2433 x3213