

Jupyter Community Workshop Proposal for Digital Humanities

Title: “Oh! the Humanities: An introduction to the digital humanities with Jupyter notebooks”

Summary

The University of Edinburgh (UoE) is looking to host a Jupyter Community Workshop focused on the uses of notebooks for teaching within the field of digital humanities. The core component of this event will be a 2-day workshop to create notebooks with pre-configured text mining dashboards that will allow non-expert users to analysis and data visualizations of large text files without prior programming knowledge. By initially hiding the underlying code used to create these dashboards this will remove the ‘fear’ barrier whilst still allowing users to explore further by revealing the code at a later date. These notebooks will then be released under an open license for use within the wider Jupyter and digital humanities communities.

Additional Events

Alongside this, we will be running introductory workshops into using Jupyter notebooks within teaching, specifically for non-computational or non-expert audiences. Some of these workshops would focus more on the myriad of uses for notebooks within digital humanities. We are also looking to leverage existing contact with local schools to firstly highlight other uses for programming that are not normally promoted as well as

highlighting the use of Jupyter notebooks as a teaching tool.

Goals

- To create pre-configured dashboard notebooks to allow non-expert users to leverage text mining capabilities.
- Increase the profile of Jupyter notebooks within the local community for use in teaching and digital humanities
- Gain specific user feedback for recommended or requested Jupyter features that would be of particular interest to a digital humanities audience for future work.

Audience

The audience for the workshop events will largely be academic colleagues based within digital humanities as well as non-expert HE users who are looking to employ computational methods into their teaching. These events will also include pupils and teaching staff from local high schools who have already shown interest and involvement with our current work with Jupyter notebooks in a teaching context.

Be Involved

We are currently looking for expressions of interest from Jupyter community members, especially core contributors to Jupyter. This event, if selected, will be held in mid-late May 2019. Give the following brief a once-over, if you would like to add your name to this or be involved then please use the Google Form to express your interest in joining us for an amazing event!

Jupyter Community Workshop Proposal – nbgrader and Jupyter in Teaching

Title: nbgrader Hackathon/Sprint

Summary

The University of Edinburgh (UoE) is looking to host a Jupyter community event based on the use of Jupyter notebooks within teaching. The core of this will be a gathering of key core contributors and local stakeholders and contributors for a nbgrader focused code sprint. Local Jupyter contributors within UoE have already spent time working on fixes and improvements for nbgrader which they are looking to release back to the community and this workshop would be able to build on this work.

Alongside this, we plan to run introductory open workshops to using Jupyter for teaching targeted at local communities we have already engaged as well as those new to Jupyter. These workshops would be attended by teaching staff from local high schools as well as those from many disciplines across the UoE.

Goals

- Improvements and fixes for nbgrader, especially in relation to its use alongside Jupyterhub when dealing with multiple students
- Increase the profile of Jupyter notebooks within the local FE and HE teaching community

- Increase the profile of nbgrader as an assessment tool for Jupyter notebooks
- Gain specific user feedback for recommended or requested Jupyter features

Audience

The audience for the nbgrader code sprint will be core Jupyter community members, local developers, the local Jupyter teaching community and those who teach computation or programming but do not currently have an automated assessment method. The wider introductory workshops will be aimed at attracting members of the local FE and HE teaching community who are looking to update their teaching materials or teaching methods. The University of Edinburgh has been working with our partner EDINA to develop a Jupyterhub system that would allow this audience an easy path to integrate Jupyter into their teaching.

Be Involved

We are currently looking for expressions of interest from Jupyter community members, especially core contributors to Jupyter. This event, if selected, will be held in mid-late May 2019. Give the following brief a once-over, if you would like to add your name to this or be involved then please use the Google Form to express your interest in joining us for an amazing event!

And we're off!

The Noteable service is into its next big pilot phase this Semester. Over 500 students will be using the service this week across 6 different courses in 6 different School within the University of Edinburgh.

But what is the Noteable service and what is the scope of this pilot? I'm glad you asked (You did ask, I heard you)

Here's a quick summary of what the pilot involves, what we will be hoping to achieve and how we will measure it. Comments are more than welcome. (Nice ones)

What will be delivered

The Noteable service is a cloud-based application providing access to Jupyter notebooks online. Noteable provides a central space to store and run Jupyter notebooks in a variety of languages.

The purpose of Noteable is to allow students and staff to access Jupyter notebooks at any time without the need for pre-installation which can be cumbersome and difficult for programming novices. Noteable is integrated with the institutional VLE to allow for a central launch point into a pre-set environment without the need for a separate login.

Duration

The initial pilot will run for the duration of Semester 1 of the 2018-19 Academic Year concluding in December 2018. Feedback information from staff and students as well as usage data and indications of further demand will be collected and presented before the end of December 2018.

Users – Students, Courses, Schools

For the pilot of this service, we have worked to ensure pilot users from across the University. The Semester 1 pilot will involve 580 students in 6 courses from 6 different Schools within the University.

We are also aware that the Noteable service will be used as part of the Digital Skills Programme and we will report of the number of students involved in these sessions at the end of the semester.

Benefit

There are multiple benefits to be derived from the Noteable service pilot. Firstly, staff who already incorporate Jupyter notebooks into their teaching will benefit from removing the need to have students install Jupyter beforehand which is time-consuming and can cause issues, especially when using multiple additional packages. We will work alongside current users in the creation of Jupyter specific OER materials which will help new users be more easily able to adopt the service.

Success Criteria

The key success criteria for the Noteable service pilot will be based around 3 components:

- 1. Demonstrate Need**
- 2. Service Fit**
- 3. Service Cost**

1. Demonstrate Need

The first goal of the Noteable pilot will be to determine that there is a need for a centrally supported notebook service for teaching purposes. This can be quantified both with the number of current users as well as secured future users. This will be broken down into two measurable indicators: number of courses using Noteable and number of students within these courses as a total. There will also be an additional measure citing the number of different Schools associated with the pilot to help ensure that the service is widely accepted across the University.

Goal: 6 Courses with up to 500 students in Semester 1

2. Service Fit

Define whether the Noteable service fits the needs of the user community. This includes comparing the Noteable service with other comparable services. This criterion cannot be easily quantified and will largely be based on the feedback from the current and prospective user community. As part of this evaluation, there will be a suggestion as to whether to use Noteable or use a comparable service.

Goal: Create a comparison document with service recommendation

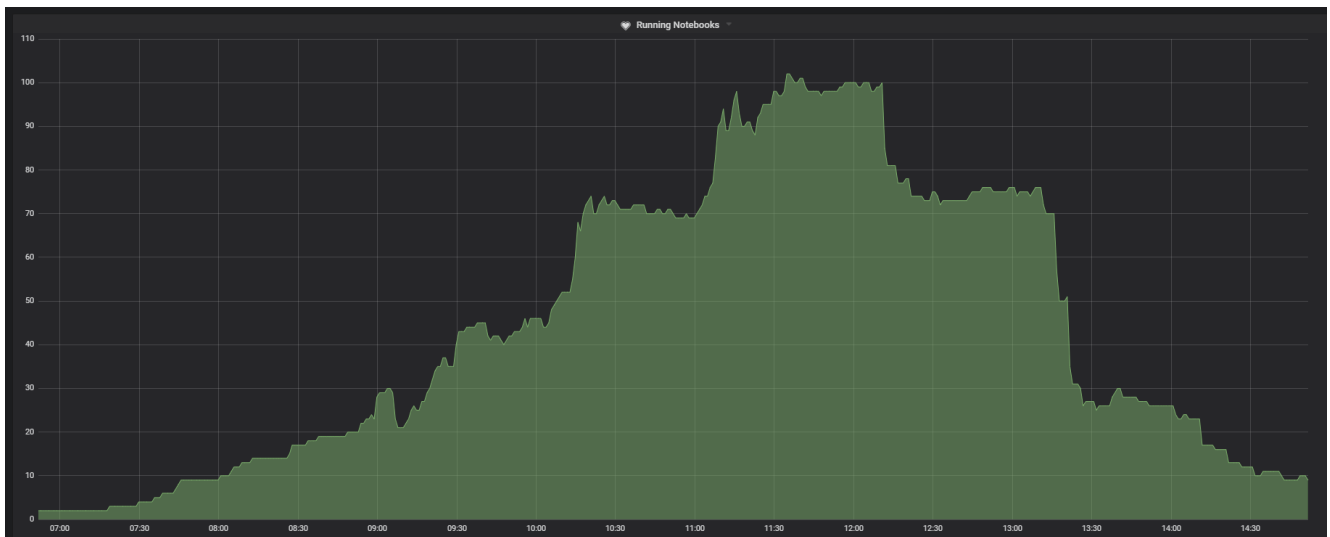
3. Service Cost

Determine the total cost of running the Noteable service including the cost of staff (both development and support) and operational/infrastructure cost. This can be determined as a yearly cost and also broken down to a per-user cost. This defined cost can then be used as part of the comparison with other comparable services as per criterion 2.

Goals: Cost per year and Cost per user.

And to makes all this seem a little more real, here's a graph

of the use for Tuesday



First ‘big’ usage day, peaking at over 100 concurrent Jupyter notebooks. The best bit is; this isn’t even our busiest day.

ProgTeach Play by Play

The first ProgTeach Symposium took place on the 24th of August, this has been something that colleagues and I have been working towards for some time so it was great to finally see this come together. The premise is fairly simple, across the University of Edinburgh lots of people teach computation in some form so let’s make time for getting as many of these people in the same room together and discuss what they do (and how they do it).

As my first main event that I’ve run at the University of Edinburgh, my main concern was that I had put something together that no one would want to attend...we filled 80% in 24 hours. As you can see below the event was pretty well attended, what you can’t see is how diverse the audience was, colleagues from 13 different schools turned up with a

smattering of units within those schools.

*At the #ProgTeach Symposium this morning
pic.twitter.com/y0cjRiCBXX*

– marioant (@marioant) August 24, 2018

So to kick us off we had an introduction from Anne-Marie Scott, Deputy Director of Learning, Teaching and Web Services. Anne-Marie has been very keen on the idea of running these types of events to get people talking together about their teaching practice and is also my boss's boss so no pressure.

<https://twitter.com/ammienoot/status/1032890247846223874>

Up next our first speaker was Dr Areti Mantaki from the Centre for Medical Informatics to talk about her experience of delivering large (huge) scale distance learning introduction to programming courses.

<https://twitter.com/ammienoot/status/1032910951983599617>

Areti shared some great incites about teaching coding generally and also some of the challenges (and surprises) of teaching entirely online. Something that a lot of attendees agreed with was how important it was to include mistakes in your examples but also spend time walking through the solution.

Areti Manataki reminds us that showing your learners the mistakes you make when coding and how you identify and fix them is part of the programming process and just as important on videos for MOOCs #ProgTeach

– Neil P Chue Hong (he/him□they/them) (@npch) August 24, 2018

Next up we had Professor Chris Sangwin and Dr Stuart King,

both from the School of Mathematics who talked about their introductory programming course. This including speaking about introducing Jupyter notebooks into their teaching as well as using CodeRunner as an assessment tool. Important to note that the students really enjoyed the 'game' of pursuing getting full marks in practice question sets.

#ProgTeach Stuart King and @sangwinc now talking about and demonstrating using CodeRunner to teach introductory programming

– Edinburgh Carpentries (@edcarp2) August 24, 2018

Then it was my turn (James Slack) to talk about the University's Noteable service currently in a pilot phase. For those not familiar with Noteable this is the University's own JupyterHub environment, giving access to Jupyter notebooks for teaching purposes. Although this is still in a pilot phase the demand has been high and we will be delivering the service to over 500 students this coming semester.

The next speaker was Andrew Kirk from the Digital Skills and Training Team who are using the Noteable service as part of their Digital Skills Programme to deliver beginner Python courses to students from across the University. The courses were overwhelmingly popular, the first session had 90 bookings for only 20 places and will run again in the coming semester.

Striking thing from this image of who signed up for @UoEDigiSkills introductory Python course (based on @EDINADigital Noteable #jupyterhub platform) is just how diverse the audience is in terms of disciplines #ProgTeach pic.twitter.com/whmFaFS1z9

– Neil P Chue Hong (he/him□they/them) (@npch) August 24, 2018

After the lunch break, we had a quick talk from Sean McGeever about the carpentries workshops in Edinburgh and the creation of a supportive RSE community. The theme of this talk about building a community to support colleagues from across the University was very closely aligned with the whole theme of the day. Sean also got the funding for cake so bonus points for Sean.

<https://twitter.com/ammienoot/status/1032940392482856966>

For the penultimate session, we wanted to focus on the on the discussion between colleagues about how they approach certain challenges of teaching computational content. Ironically no-one had the confidence the attempts to answer “How do you build confidence in learners”.

Heres a full breakdown of the discussion points – Discussion (Word Document)

And then to wrap up the day we had a quick talk about creating Jupyter based OERs to support new users, there is obviously a lot of material out there for ‘Intro to Python’ already but what can be really useful is a collection of these in notebook form that we know will work straight away in Noteable and also some ancillary materials about how to use notebooks to make it easier for people to introduce them into their teaching.

And that was that! A very interesting line up of talks and very useful discussion between disciplines which is something I’m always interested in promoting. I’ll leave it to Anne-Marie to wrap up the day:

<https://twitter.com/ammienoot/status/1032985095454515201>

And yes, there will be another one!

Service Comparisons

A large part of my current project involves looking at other companies or services that offer Jupyter notebooks. The University has decided that it wants to provide notebooks but we also have to justify creating our own service. If there is something else that does what we need is it worth making our

own version of it?

With this in mind, I have been creating a shortlist of services that are comparable and also drawing up a list of criteria to compare.

Here is the list of services:

Microsoft Azure Notebooks

Google Colaboratory

CoCalc

Anaconda Enterprise

And here's a list of the criteria against which they will be compared:

Pricing (how much do they charge and how do they charge it, what do you get access to when you pay, is there a free tier etc.)

Technical Specifications (e.g. RAM, CPU cores, Storage)

Extensions Available (e.g. nbgrader, RISE)

Supported Languages (There are many varied use cases throughout the university so how do we make sure all are supported, how quickly does the service add requested kernels.)

Focus/Audience (e.g. Azure is focused on Machine Learning, Google Colab is focused on collaborative programming)

Business Model (e.g. Azure is currently in a preview stage and may not be continued)

Community (This includes using the community as a measure of sector involvement and also how quickly the service administrators respond to feature requests or issues)

This comparison will take place over the summer and then I will publish our results. This is all about making sure that we are providing the best service that suits the needs of our users.

If you have anything you would like to add or think we have left any service or criteria out then let me know.

Noteable's place in the City Region Deal

Heard of the City Region Deal for Edinburgh? No?! Well go check it out now, I'll wait here for you.

City Region Deal Homepage

Interesting right? Well, I managed to gather some more information recently from one of the launch events currently making their way around the University. After you've gotten over the astounding £1.1bn investment there are some even more intriguing numbers on display. The one that I am mostly drawn to is the target to produce 100,000 students with a formal certification in Data Science related skills. Thankfully this is spread out over 15 years and is also shared with Heriot-Watt University but this is still a very significant commitment.

This doesn't mean that we will become a factory churning out Data Scientists but it does mean that many of our students will leave with some amount of training and understanding of data science and the associated digital skills which Edinburgh and the wider world demands. Integrating key data science skills into a wide variety of areas of study means that more

students will be equipt to compete in a digital world and we can also help to create new data initiatives based on the varied insights of our students.

There is also a social side to this deal which means that the benefits are not confined to the University but to the wider region both in terms of the economic benefit of new or improved businesses but also providing digital skills training to the public to further help drive the digital economy of the area.

So where does the Noteable service come into all this? The Noteable service provides a platform for learning how to programme and manipulate data. This platform is especially helpful for introducing students and learners to the basic concepts of a language quickly as it doesn't need any pre-install. It may be a small cog in a very big machine but it shows that the University of Edinburgh is committed to helping to develop digital skills by providing such a platform. As well as supporting teaching 'in-house' the service is also well geared towards introductory courses for the public as it requires little setup or programming knowledge beforehand.

All I need to do now is find some willing instructors.....

If you have any ideas on how you could become involved in the City Region Deal then the official advice is to contact your Head of School however if you are planning on using Noteable then let me know – james.slack@ed.ac.uk

Jupyter Literature

Lately, I've been looking into the uses of Jupyter notebooks within a teaching context and I've noticed something of a lack

of literature. There are articles looking into the other uses of notebooks (collaborative and reproducible research) but little in the way of articles about the introduction or use of them within teaching. There has been a growing movement to introduce Jupyter notebooks within teaching especially in higher education institutions but, at the moment, the 'noise' about them seems mainly confined to those circles. I'm not saying that this is bad as the community built around Jupyter notebooks is amazing but the lack in literature makes it difficult to get outsiders on board, specifically IT departments who could be helping to build the infrastructure to support notebook use in their institutions.

If we can address the gap then it will be easier to get new people involved and also get buy in from institutions as a whole and help embed notebooks into teaching (providing we can prove that there is a benefit) Hhmmmm... seems like the scope of this project may have just expanded.

I'll keep this blog updated with any findings as we go along, feel free to chip in if you have any experiences or knowledge of using Jupyter notebooks for teaching.

How to Succeed at Failing

Aside from being a learning technologist a big interest of mine is American football (Philadelphia Eagles fan). As you might imagine its very rare that these two aspects of my life coincide but something about the end of the Super Bowl stood out to me. In a speech just after the win Nick Foles, the Eagles quarterback, mentioned something that I believe to be very important both in life and in learning.

"I think the big thing is don't be afraid to fail," Foles

said. "When you look at it, you have a bad day, you think your life isn't as good, you're failing. Failure is a part of life. It's a part of building character and growing. Without failure, who would you be? I wouldn't be up here if I hadn't fallen thousands of times, made mistakes. We all are human. We all have weaknesses."

Failure has traditionally had something of a bad reputation, something to be avoided at all costs, but there has been a growing idea that failure is a key part of the learning process (see list below). If you don't fail you won't grow, you won't learn what your current limits are and you aren't going to develop your skillset. Failing also builds resilience, which is something that employers are increasingly interested in, having employees that can deal with setbacks and carry on working creatively to solve a problem is a great asset.

Today, however, I want to talk specifically about how we can use Jupyter notebooks as a place to fail in a positive way. For those who haven't heard of these, I've done a brief introduction here. One of the most useful parts of notebooks is being able to immediately see the output from your code cells. This allows you to 'fail fast', quickly trying something and then adjusting based on the outcomes. By repeatedly trying something and adjusting every time you build resilience and start to learn how to adapt your skills to a situation.

The next part we need to talk about is how we document failure. I don't mean making students wear dunce caps but I do think it's important to detail the steps you went through even if you ended up failing. Early on in school I was always told 'show your working' which I definitely didn't do but now I understand the importance of the concept. Getting a question wrong on a test doesn't necessarily show me what you don't know but understanding how or why you got it wrong certainly does. Showing that you have failed, tried again and then

succeeded shows me even more.

I'm interested to hear your opinions on this, as an academic do you think it is helpful to have students include their failed attempts or would it make marking more difficult? Add your comments below.

List of Failures

Failure Is Essential to Learning – Edutopia 2015

Stanford Resilience Project

The Importance of Failure in Learning – ironically a failed attempt to introduce failure

Is Failure Useful – a bit off piste about failure in museums but worth a read

Innovation: Learning from Failure – An interesting insight into the tech industry's embrace of failure

Hello World

It's alive! ALIIIVEE!!!! [Cackles manically as thunderclaps in the background] The Noteable service is alive, up and running, ready for action. Okay so actually it was technically alive last year as people just couldn't wait that long but now it's official. In brief, the Noteable service is a cloud-based service providing Jupyter notebooks. If you haven't come across computational notebooks before then I've written a brief explainer [Here](#). We are now into the pilot phase of this project, looking into the benefits (and cost) of providing a centrally supported cloud-based notebook service. Whilst Notebooks have implications for many different areas, we are

specifically interested in the benefits within learning and teaching. I've copied in the scope section of the project draft so that you can get more of an idea of the main aims of this pilot.

Scope

- To assess the pedagogic impact of using notebooks to introduce programming concepts.
 - To assess the desire and need for a centrally support notebooks service within the University of Edinburgh
 - To assess the use of Jupyter notebooks for creating OER materials
 - To assess the running cost of supplying this service within the University of Edinburgh
 - Work with EDiNA to develop a development plan for the Noteable service to incorporate service improvements and feature requests
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Sounds easy enough right? Generally, as a learning technologist, you have your hand snapped off when you offer up a new service that people are interested in but the important work will be quantifying the impact offering this has and comparing it with what it costs the University to provide. There's a small bonus part in here that I am particularly interested in, OERs, I think that notebooks make a great basis for OERs. They can be easily shared via Binder or nbviewer and they can be easily aligned with the 5 Rs. I'll be trying to blog about this rather regularly, either working with Edinburgh academics to publish OERs or pointing out interesting existing resources.

Computational notebooks have been growing in use for a variety of uses in recent years, especially within HE institutions but

this has created something of a quandary (or at least an opportunity). A lot of Jupyter notebooks use currently seems to be based around individual academics or small teams working to deliver their own material in their own way, there is little in the way of central support. This bit is where Noteable comes in, developed by EDINA, this is a centrally support service at the University of Edinburgh to provide notebooks. The idea is first to provide the service so that users have access to notebooks online, my part is to then make sure that users have the support they need to integrate these into their teaching. Alongside this, we want to create and promote a community of notebook users and publicise their uses to get more people involved. Some people will have come across notebooks before and are already using them in interesting ways but there are a lot more people who could start to use them if supported in the right way and that's what I'm here for.

If you are a member of staff and are interested in using the service then get in touch. If you have stumbled in here from the wilds of the general internet then watch this space, I'll keep you posted.