

Mentor Academy

Anant Mittal (anmittal@umich.edu), Christopher Brooks (brooksch@umich.edu), Victor Pang (vicpang@umich.edu)



What is the Mentor Academy?

The Mentor Academy is a participatory lifelong learning community for data science learners. It is based on traditional instructional methods in the form of an online MOOC offering through Coursera. As learners complete the MOOC specialization they are invited to come back to the community to further develop their own data science practice while helping others. Thus it is a form of learner sourcing (Kim, 2015), and merges crowd sourcing with group learning and mentorship.

In the first iteration of the Mentor Academy, we recruited 120 users to help build new content in the form of questions and tutorials for the *Introduction to Applied Data Science with Python* course. This content is culturally diverse, reflecting the background and experiences of the mentors.

Quintana, R., Brooks, C., Smothers, C., Tan, Y., Yao, Z., Kulkarni, C. (2018) Mentor Academy: Engaging Global Learners in the Creation of Data Science Problems for MOOCs. 13th International Conference on the Learning Sciences (ICLS18). 2pp

In the next generation of the Mentor Academy we are focused on improving this system through continuous improvement through learner sourcing.

Why the Mentor Academy?

Human feedback is still the gold standard with respect to educational evaluation except in all but the most narrow domains. But, human evaluation and feedback scales poorly; it's expensive, difficult, and leads to tradeoffs which are both epistemologically ill-fit and potentially biased based on learner study methods and backgrounds. Personalization technologies have the opportunity to help ameliorate these issues, by evaluating a breadth of kinds of student submissions and providing feedback collected from a range of sources like instructors, peers, mentors, and the web.

In the next version of the Mentor Academy we aim to capitalize on the availability of and the deep and diverse talents of mentors for continuous improvement of the educational systems. Mentors not only create new problem sets, but monitor how students complete those problem (analytics) and improve, refine, and iterate on the problems offered. Mentors further their own knowledge in the area through teaching, and have opportunities to gain credentials (e.g. cred.ly) showing mastery of data science topics.

Vision of Mentor Academy

Mentors - These are learners who have completed the course and want to create questions and datasets around the problems they feel are important.

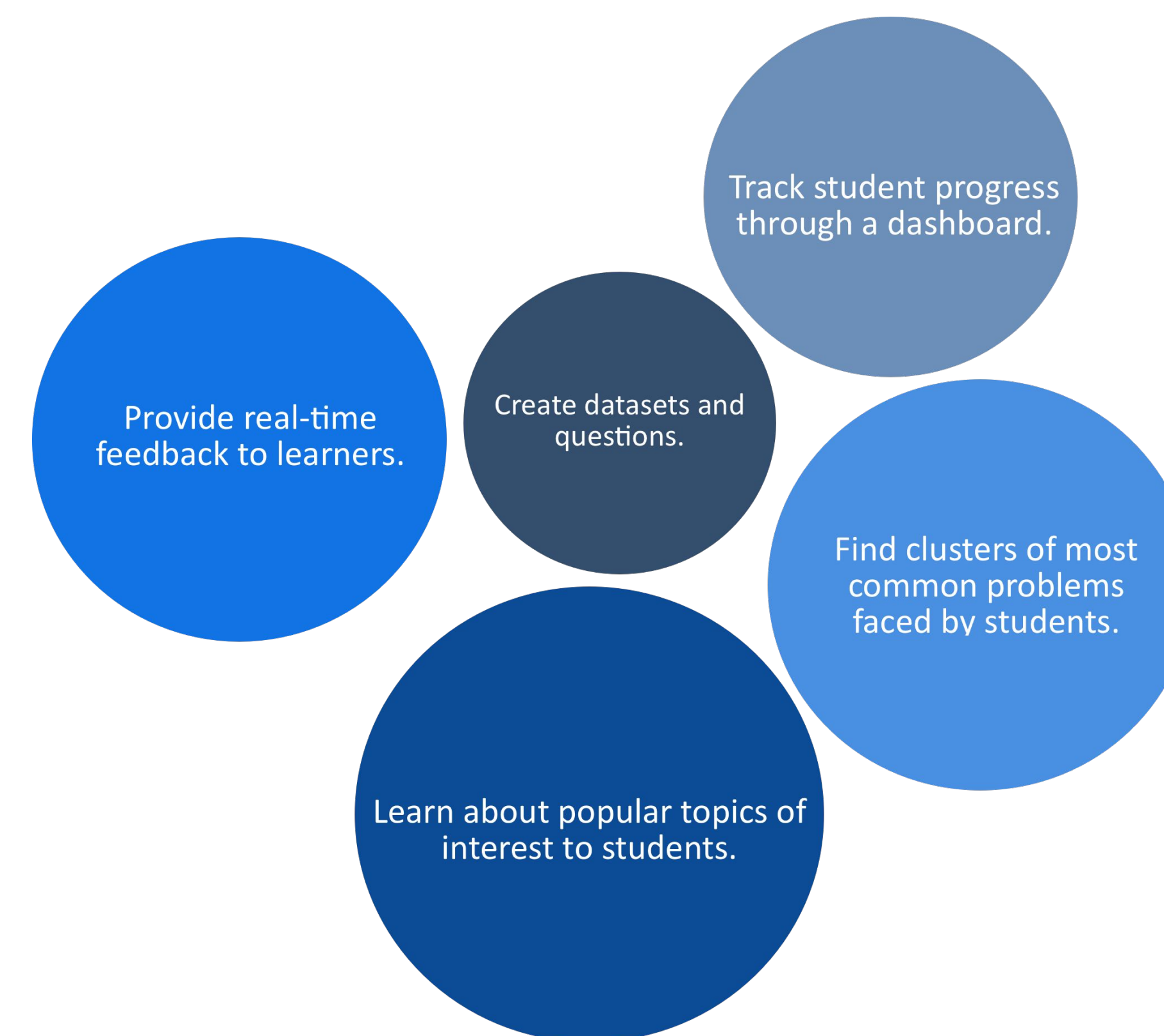


Figure 1: Platform features for Mentors

Learners - Any user who is eager to delve into the data science to learn about best practices, acquire a new skill, or practice trending methodologies.



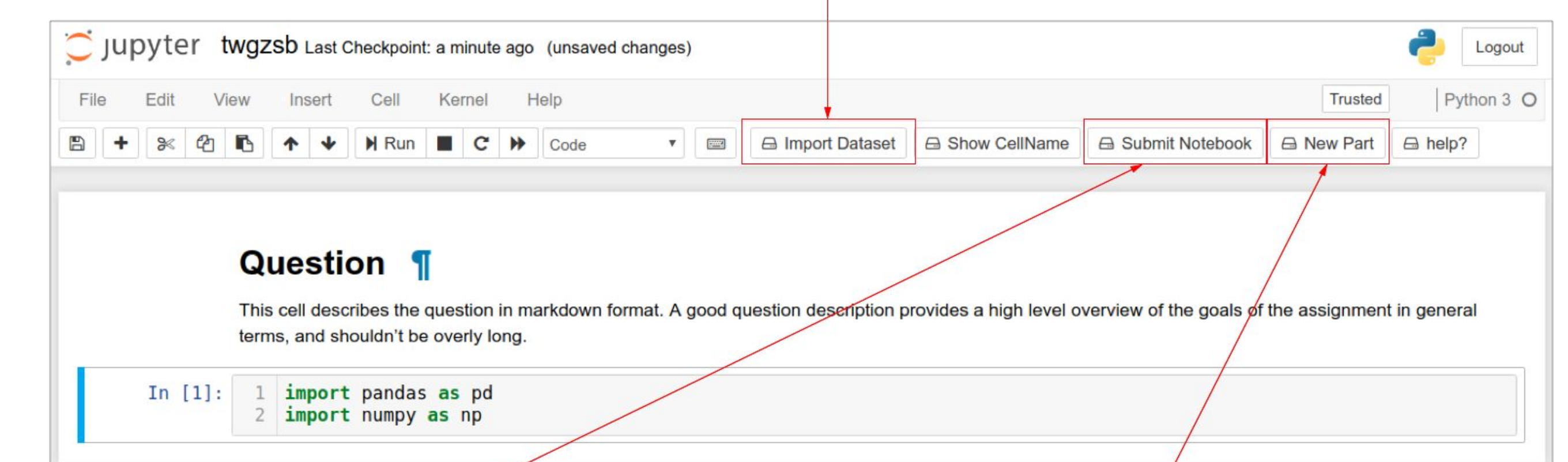
Figure 2: Platform features for Learners

Implementation

The front end of the platform is built on top of Project Jupyter. Project Jupyter allows us to create jupyter notebook extensions in JavaScript using which we can enhance the functionalities of the jupyter notebooks. The backend APIs have been written in Flask using Python which have been hosted on AWS Lambda. For storage, we are using Amazon MySQL RDS Db instance, with learner interaction data stored in AWS DynamoDB.

The intent is to build the Mentor Academy as a reusable plugin, available to any Jupyter-based data science course.

Lets a mentor select a dataset from a repository and inserts two cells in the Question notebook. The first cell describes the dataset. The second cell includes the python code for fetching data from the web, cleaning it, and assigning to a dataframe.



Once the mentor is done creating questions they can save the notebook with metadata and taxonomy.

Lets a mentor add additional questions (denoted as parts) to the question notebook.

Figure 3: Snapshot of the platform for Mentors

Next Steps

We are rolling out a beta version of the platform for the mentors to collect initial feedback and simultaneously developing the learner's side of the platform.

We also have about 200 users (Christopher's Coursera students who have completed the first course in Applied Data Science with Python Specialization) who are ready to start using our platform as Mentors.

Acknowledgment: Authors would like to thank MIDAS and Office of Academic Innovation for their support.

