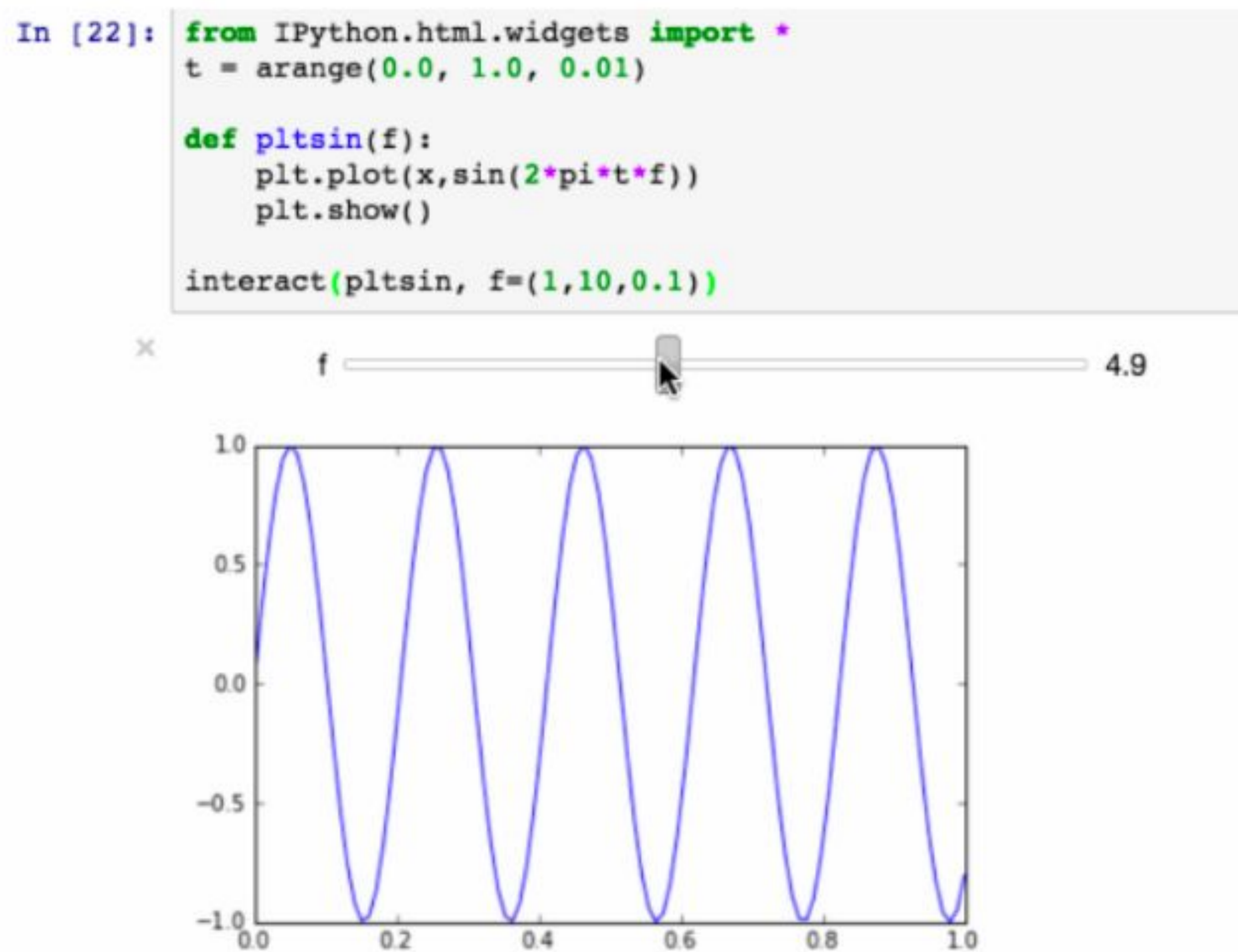# Interactive Notebooks for Mastery in Psychology Methods

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Problem Statement:

Learning quantitative skills in psychology presents challenges due to skill compounding, leading to learning gaps for many students.

Proposed Solution:

```
In [22]:  from IPython.html.widgets import *
          t = arange(0.0, 1.0, 0.01)

          def pltsin(f):
              plt.plot(x,sin(2*pi*t*f))
              plt.show()

          interact(pltsin, f=(1,10,0.1))
```


Utilize interactive notebooks to implement a mastery-based learning approach in psychology education.

Interactive notebooks combine code and text, allowing students to engage with data and concepts through interactive features.

Incorporate all course materials into a single document for lectures, in-class exercises, and homework.

How It Works:

Develop interactive notebooks with a programmer to serve as lecture slides and in-class exercises.

Deliver live lectures using code-based slides, enabling interactivity and hidden structures.

Students can explore and practice with the same notebook, progressing at their own pace once they achieve mastery.

Instructor assists students at various stages during in-class sessions.

Course Description:

Pilot project: "Bayesian methods in psychology" for the Cognitive Data Science program in Fall 2025.

Focus on testing and refining the interactive notebook method.

Impact Evaluation:

Gather qualitative and quantitative feedback from colleagues and early-course PhD students.

Assess the development of mastery in quantitative skills

Theoretical Themes:

Mastery Learning: Emphasizes achieving a deep understanding before advancing, addressing learning gaps.

Constructivism: Encourages hands-on, experiential learning through interactive notebooks.

Active Learning: Promotes student engagement and participation.
Flipped Classroom: Involves students actively engaging with content during lectures.

Technology-Enhanced Learning: Integrates digital tools for personalized, self-paced learning.

Formative Assessment: Supports ongoing feedback and adjustment of instruction.

Collaborative Learning: Encourages peer interaction and cooperative problem-solving.

Data Collection:

Survey data collected from students and peers, including qualitative evaluations on theoretical ambitions.

Survey Questions:

Mastery: To what degree did interactive notebooks contribute to a sense of mastery?

Self-paced learning: Did you benefit from the self-paced course mechanism?

Technology: Did technology enhance or detract from the course experience?

Peer reviewers will answer these questions and provide qualitative assessment of the method relative to their experience with classical teaching of similar content.

Summary

This project aims to address the challenge of learning quantitative skills in psychology and test the effectiveness of interactive notebooks as a mastery-based solution.