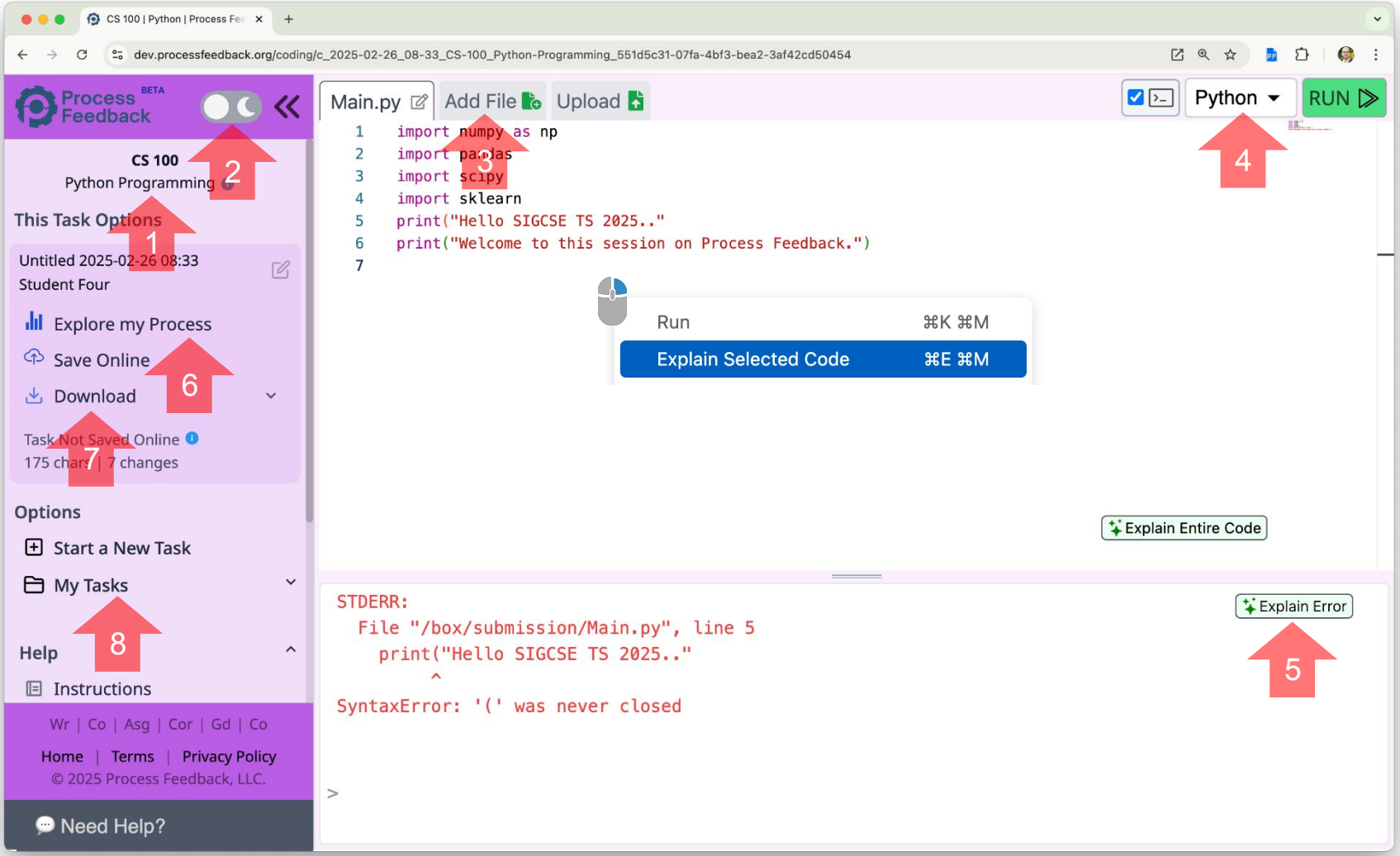
Tutorial 102: Teaching Coding in the Age of AI: A Hands-on Tutorial on Process Feedback

Badri Adhikari and Jie Hou

🕐 Web 26 Feb 2025 7 PM to 10 PM | 📍 Meeting Rooms 310 - 311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Process Feedback BETA
CS 100
Python Programming
This Task Options
Untitled 2025-02-26 08:33
Student Four
Explore my Process
Save Online
Download
Task Not Saved Online
175 chars | 7 changes
Options
Start a New Task
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Need Help?
Main.py
Add File
Upload
Python
RUN
1 import numpy as np
2 import pandas
3 import scipy
4 import sklearn
5 print("Hello SIGCSE TS 2025.."
6 print("Welcome to this session on Process Feedback.")
7
Run ⌘K ⌘M
Explain Selected Code ⌘E ⌘M
Explain Entire Code
STDERR:
File "/box/submission/Main.py", line 5
print("Hello SIGCSE TS 2025.."
^
SyntaxError: '(' was never closed
Explain Error
>
1
2
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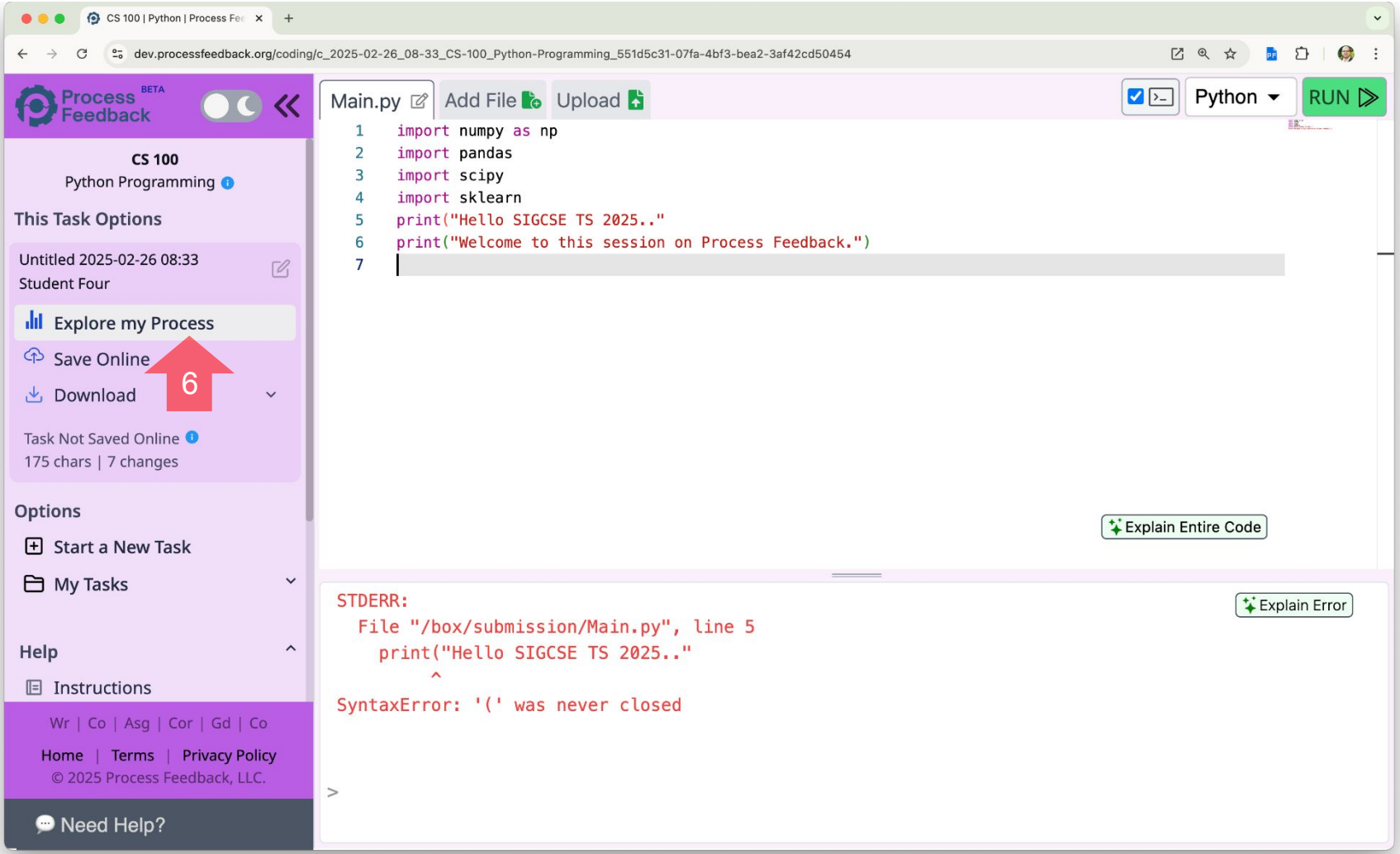
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CS 100 | Python | Process Fe… × UMSL CS 1250 | Code | Proce… ×

app.processfeedback.org/coding/c_2024-07-21_23-37_UMSL-CS-1250_Intro-to-Python-Programming_cf9eeaa8-80c8-4cf9-935d-7b06e449514e?report=true

Sum N natural Numbers (py)

Aayog Adhikari

UMSL CS 1250 | Intro to Python Programming

UMSL

Final Code

Metadata about the final code

- Final Code: 23 lines | 334 characters
  - Code Characters: 195
  - Comment Characters: 139
- Typing Speed: 43 characters/minute
- Process Data: Showing 46 changes made every 5+ seconds

Coding Time

Shows total active typing time and non-typing time

- Total Typing Time: 7 min 50 sec
- Total Task Duration: 11 min 54 sec

Playback

Shows the typing process like a movieSelect the handle to use keyboard. Watch tutorial

Play | 100% | Fast | Test this Code

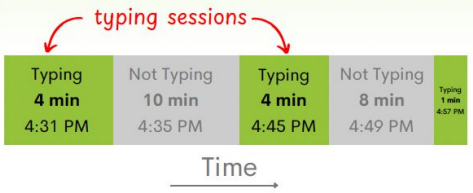
Main.py

```
# Aayog's first Python code

x = input("Enter a number:")
```

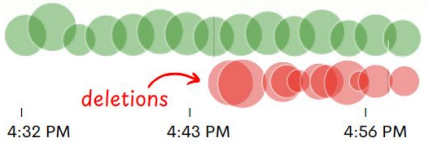
Typing Sessions

Shows streaks of active typing and not-typing durations.



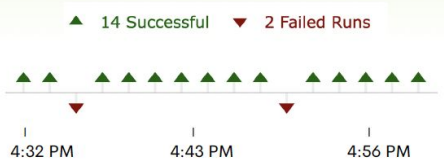
Text Added and Deleted

Shows if the student typed fluently or was often deleting while coding. Size of the circle corresponds to number of characters.



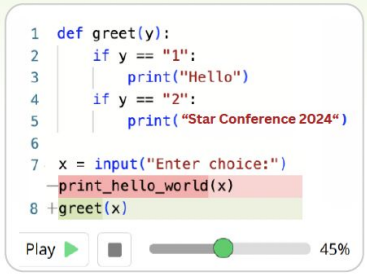
Code Execution History

Shows how often a student's code failed or passed.



Watch Playback

Shows the student's typing like a movie, with options to play, pause, and use a slider.



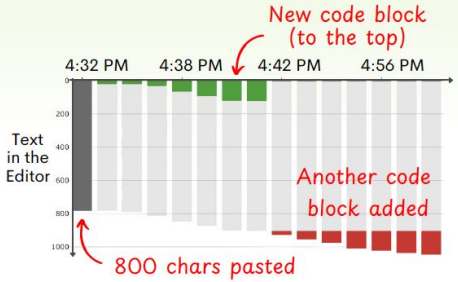
Text added are shown in green highlights, and those deleted as in red highlights .

Active Days

Shows which days the student was active on the editor.

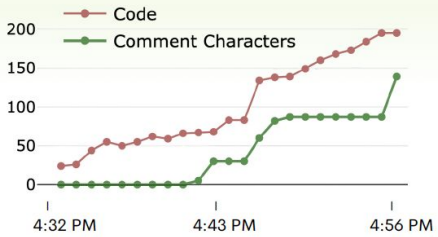
Location of Edited Code

Shows which code were edited at which point in time.



Each code block is assigned a color. Highlighted bars show the code edited at that time.

Comments in the Code



Paste Events

Shows how often student copy-pasted.

Total Paste Actions: 3 times.

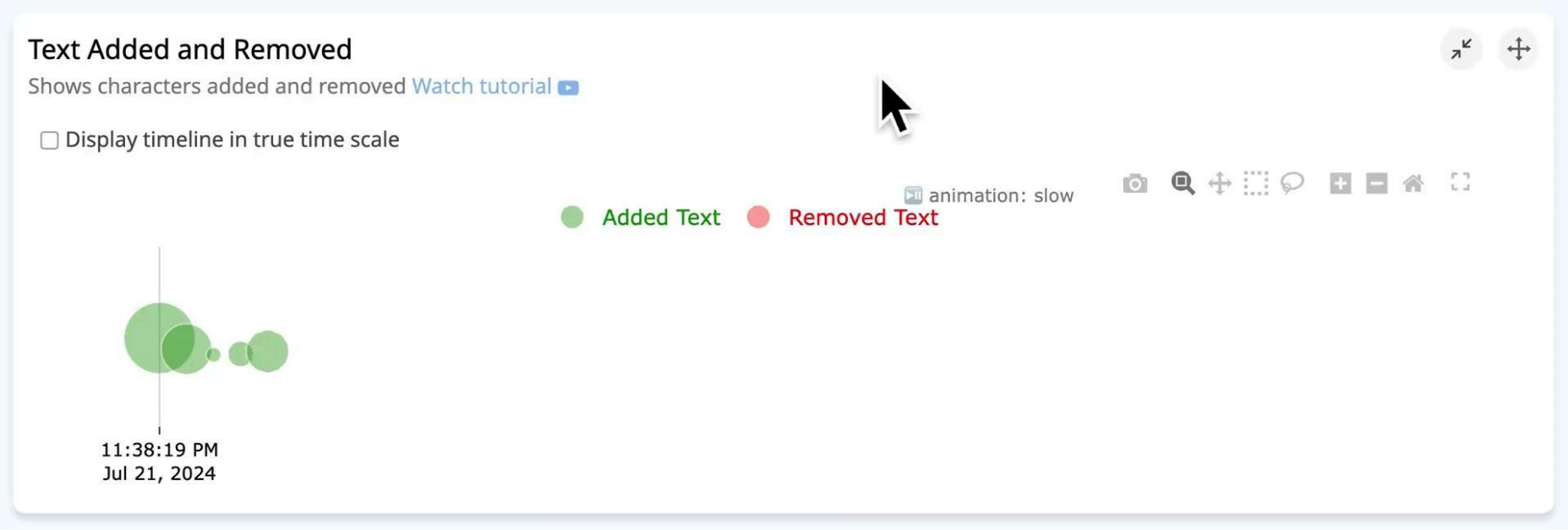
1. At 4:32 PM, 800 characters were pasted
2. At 4:35 PM, 300 characters were pasted
3. At 4:36 PM, 175 characters were pasted

PDF

Students can download everything (including code) **as a single PDF**.

Makes grading easy!

Timeline of characters added/removed



Who is using Process Feedback?

- ~150 students, every semester, at UMSL since 2023
  - in C++ and Python courses
- ~500 students at several other institutions and countries
  - in C, Python, and Java courses
- ~2,000 students at high-schools/universities in Europe & US
  - for writing assignments

Process Feedback's accessibility

- It is free
  - requires no sign up

- It is privacy-centered
  - data is stored locally in the browser

- Google doc support
  - released in July 2024

- Google Colab support
  - released in December 2024 (but still under test)

- Approved by University of Missouri System
  - for use in all four campuses

Thinking beyond Chatbots' Threat to **Education**: Visualizations to Elucidate the Writing or Coding Process

B Adhikari - **Education Sciences**, 2023 - mdpi.com

Despite overwhelming evidence to the contrary, **educational** practices continue to be … is challenging in most **educational** settings. To address this long-standing issue in **education**, this …

A template for writing peer-review (and some tips) by Badri Adhikari (please remove this header)

Peer review of manuscript/project

Reviewer's name (your name):
Author's name:
Date reviewed:

Your review should be free of your "feelings." Any comment you make, positive or negative, should be backed by concrete observations. Statements such as "Looks good!", "Nice report!", "Bad report!" and "Great job!" are *meaningless* (yes, useless!) because they don't inform the author about what they should keep, fix, or change. Your review should be divided into four sections: summary, serious concerns, major comments, and minor comments.

Potential conflict of interest

Potential conflict

Dr. Adhikari owns Process Feedback LLC, which develops the tools discussed in this presentation.

Focus of this session

- Going beyond any specific tool—free or otherwise—to provide students with process feedback
- Introducing a new perspective on AI usage in CS1, emphasizing reflection

Acknowledgments

Students, Volunteers, Family, Friends, and Freelancers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Nitesh Kafle


Prabhat Timsina


Emma Scally


Nazire Koc


Bishal Shrestha


Shaney Flores


Nilima Kafle


Chirayu Prasai


Griwan Khakurel


Aayusha Singh


Jie Hou


Khem Aryal


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