IMPERIAL

Coding

live, participatory, static

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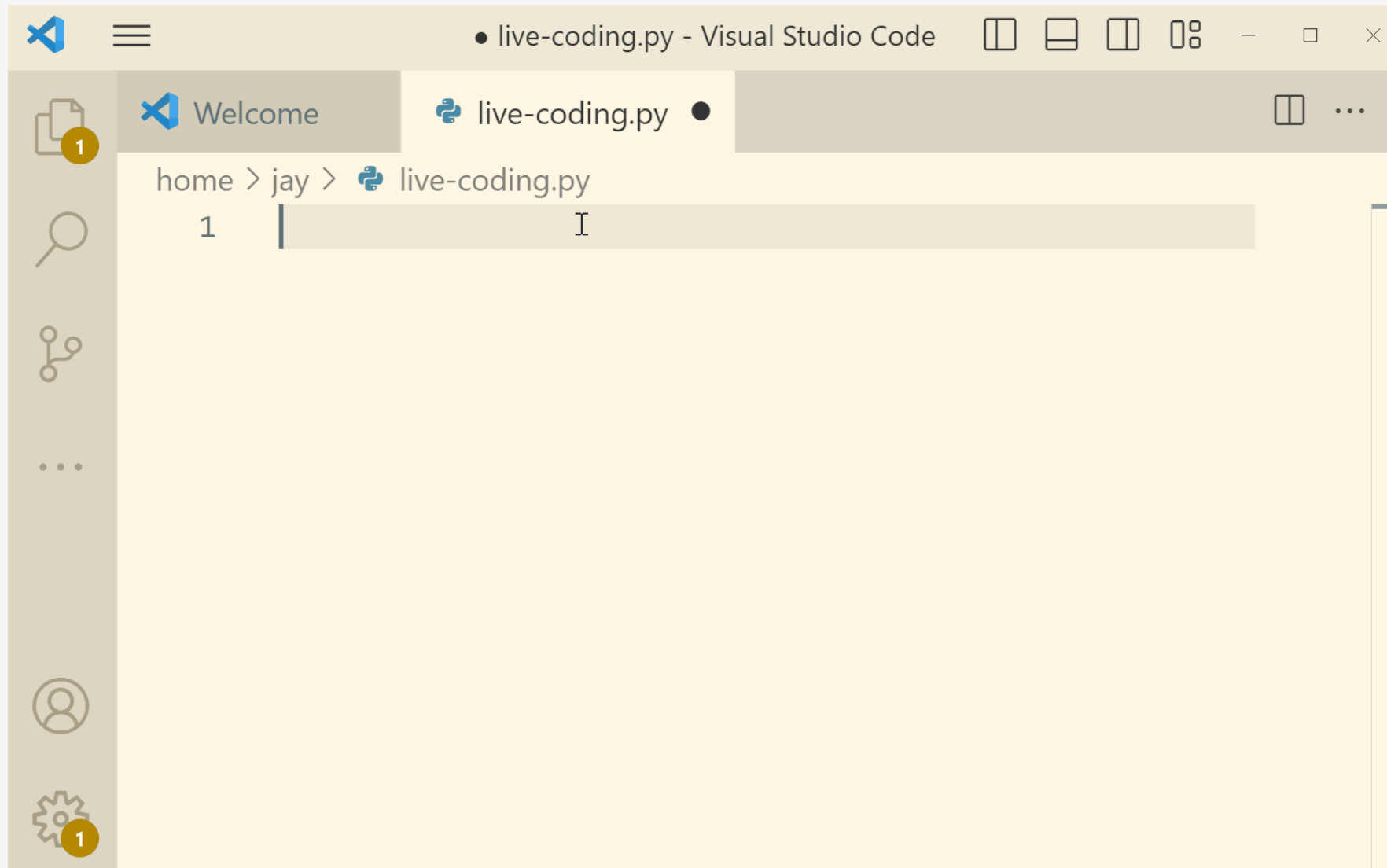9/4/2024

Graduate School
Supporting the Postgraduate student experience
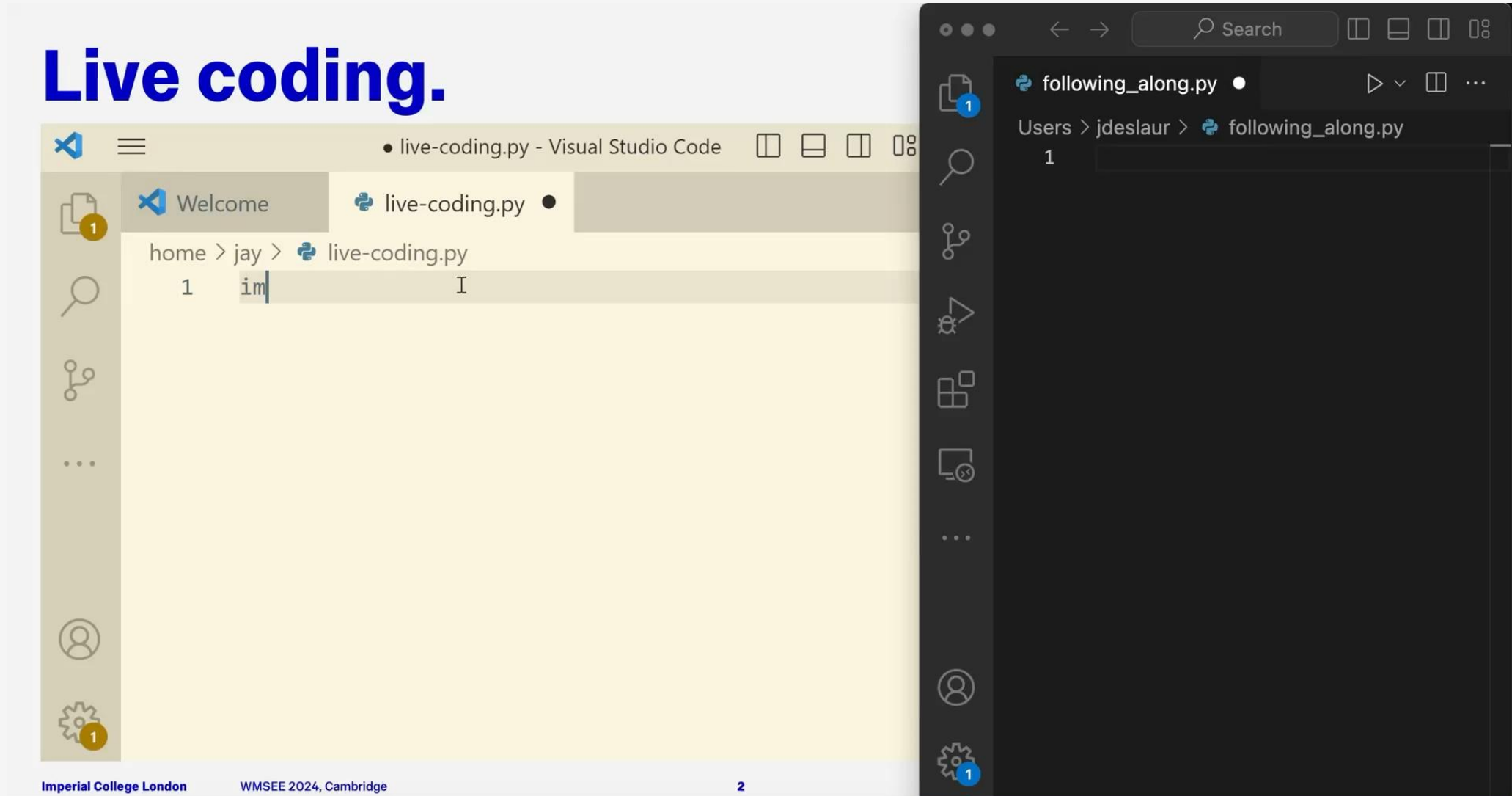
Live coding.

Participatory live coding.

Static code.

```
1    import sys
2
3    def main():
4        print("Hello World")
5
6    sys.exit(0)
7
```

Hello World in Python

- First, we import necessary packages
  - **sys** for system-level features

- Then we define a function using the **def** keyword

- Inside the function, we call **print**, passing in a string
  - Notice the indentation, this is important!

- We decide not to call the function, and exit instead
  - We use **exit** from the **sys** package to do this!

Some evidence for…
live coding

Students learning via live coding

performed better on a large project

than students in a static code control group[1]

Students learning via live coding

experienced lower extraneous cognitive load

than students in a static code control group[2]

A systematic review of the literature in 2021 noted six perceived benefits[3]

improved debugging   **programming as a process**   **increased engagement**

applying concepts   **incremental programming**   **improved testing skills**

1. Rubin, M.J., 2013, March. The effectiveness of live-coding to teach introductory programming. In Proceeding of the 44th ACM technical symposium on Computer science education (pp. 651-656).
2. Raj, A.G.S., Gu, P., Zhang, E., Williams, J., Halverson, R. and Patel, J.M., 2020, February. Live-coding vs static code examples: which is better with respect to student learning and cognitive load?. In Proceedings of the Twenty-Second Australasian Computing Education Conference (pp. 152-159).
3. Selvaraj, A., Zhang, E., Porter, L. and Soosai Raj, A.G., 2021, June. Live coding: A review of the literature. In Proceedings of the 26th ACM Conference on Innovation and Technology in Computer Science Education V. 1 (pp. 164-170).

Some thoughts on…
participatory live coding

Participatory live coding may

offer a more active form of learning

while live coding on its own is not (necessarily)[3]

Participatory live coding may

reverse the benefits in cognitive load

compared with live coding on its own

Participatory live coding is

championed by The Carpentries[4]

and used extensively in their workshops

You can read their top ten tips here[5]

4.   carpentries.org
5.   Nederbragt, A., Harris, R.M., Hill, A.P. and Wilson, G., 2020. Ten quick tips for teaching with participatory live coding. PLOS Computational Biology, 16(9), p.e1008090.

Some good in…
static code

Static code is more appropriate for

erroneous worked examples,

which may be effective in supporting learning[6]

Static code is more appropriate for

presenting Parsons problems,

which may be effective in supporting learning[7]

Students learning via static code

performed better on a traditional exam

than students in a live code experimental group[1]

6.   Beege, M., Schneider, S., Nebel, S., Zimm, J., Windisch, S. and Rey, G.D., 2021. Learning programming from erroneous worked-examples. Which type of error is beneficial for learning?. Learning and Instruction, 75, p.101497.
7.   Parsons, D. and Haden, P., 2006, January. Parson's programming puzzles: a fun and effective learning tool for first programming courses. In Proceedings of the 8th Australasian Conference on Computing Education-Volume 52 (pp. 157-163).

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Thank you