Introduction to Expyriment

Programming Psychology Experiments (CORE-1)

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The plan for today

1. Finish last week’s exercises (20′)
2. Your feedback (5′)
3. Introduce expyriment (15’)
4. Start coding with expyriment (50′)

Last week’s exercises

Tasks for you

```
Barbu@Mac % cd your-path/Programming/Assignments/Week-1/Exercises
```

Those of you who solved Exercise 1.1 only: Solve the next exercises

```
Barbu@Mac Exercises % python Exercise-1.1.py
```

Those of you who only solved Exercise 1: Solve Ex. 2–7 in VS Code

Those of you who solved Exercises 1–7: Raise your hand, we will come and look at your solutions

When done:

```
Barbu@Mac Exercises % cd ..\..
Barbu@Mac Assignments % git add .
Barbu@Mac Assignments % git commit -m "Week 1 Exercises"
Barbu@Mac Assignments % git push origin
```

Difficulty of Week 1’s assignments

Fill in the form at https://forms.gle/TPDjfrC3Ejww1q26A

Admin stuff

Assignments

Each week, you are expected to submit your assignment solutions **twice**

1. At the **end of each session** (5 minutes before class ends)
2. By **Sunday at 12:00 pm** for the exercises not completed in class

Both submissions count toward your evaluation

Solutions submitted **after the deadline** will **not** be considered

Our own solutions will be posted on GitHub every Monday

Discord channel

Join at **https://discord.gg/7HYSf9UU**

Use it to **ask questions** about assignments when you get stuck

Don’t hesitate to **answer other people’s questions yourself**

We will also use it to **provide feedback** on your assignments

Use your full name and (only if you’re comfortable) upload a photo

Expyriment

What is expyriment?

A Python library for designing and running psychology, neuroscience, and psychophysics experiments

It’s meant for researchers who need to **present stimuli** (text, images, sounds) and collect responses (e.g., key presses) **with good timing precision**

Pros of expyriment

A **clean and simple** psychology experiment generator, which promotes good programming practices (readability)

It relies on Python, so it aims to be **reproducible** across platforms (we'll see about that!)

It allows researchers to **focus on the high-level, abstract structure** of experiments without having to code low-level timing or graphics routines themselves

Cons of expyriment

It relies on Python, so it's **not possible to run remote online experiments** (for this, you will learn jsPsych later on in the course)

It has a **small user community**, which means that there are not many demonstrations/examples on the web (the interface, however, is very well documented)

> *Note*: This also means that **LLMs will often hallucinate** when prompted about expyriment since the training data is sparse

What does this code snippet do?

```
fixation = stimuli.FixCross()
circle = stimuli.Circle(radius=50)

fixation.present()
clock.wait(1000)
circle.present()

keyboard.wait()
```

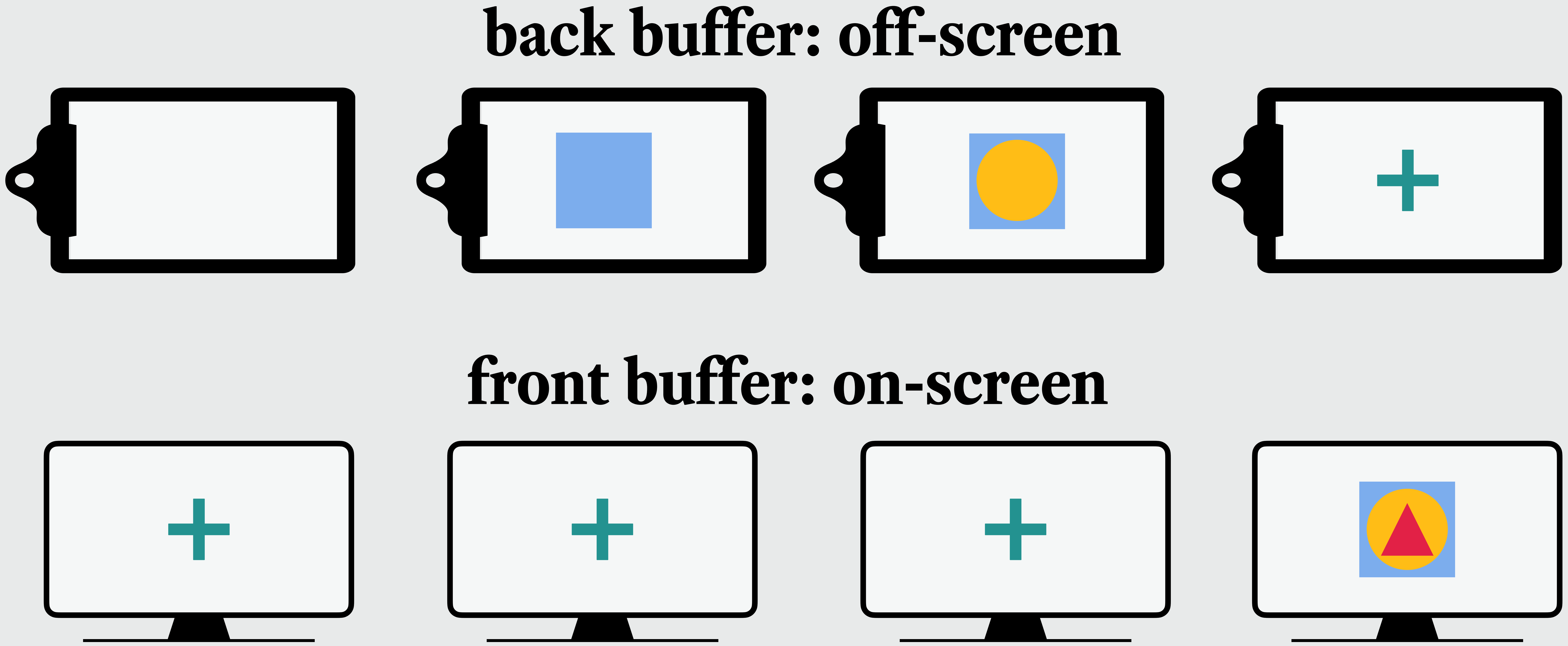
Let’s dig into it: https://github.com/barburevencu/PPE/blob/main/Week-2/Instructions.md

The first expyriment script

```python
from expyriment import design, control, stimuli

exp = design.Experiment(name="Circle")
control.initialize(exp)

fixation = stimuli.FixCross()
circle = stimuli.Circle(radius=50)

control.start(subject_id=1)

fixation.present(clear=True, update=True)
exp.clock.wait(1000)

circle.present(clear=True, update=True)
exp.keyboard.wait()

control.end()
```

stimulus.present()

```
square.present(clear=True, update=False)
circle.present(clear=False, update=False)
triangle.present(clear=False, update=True)
```



back buffer: off-screen

front buffer: on-screen

Solve Exercise 1

Exercise 1: Superimposed objects

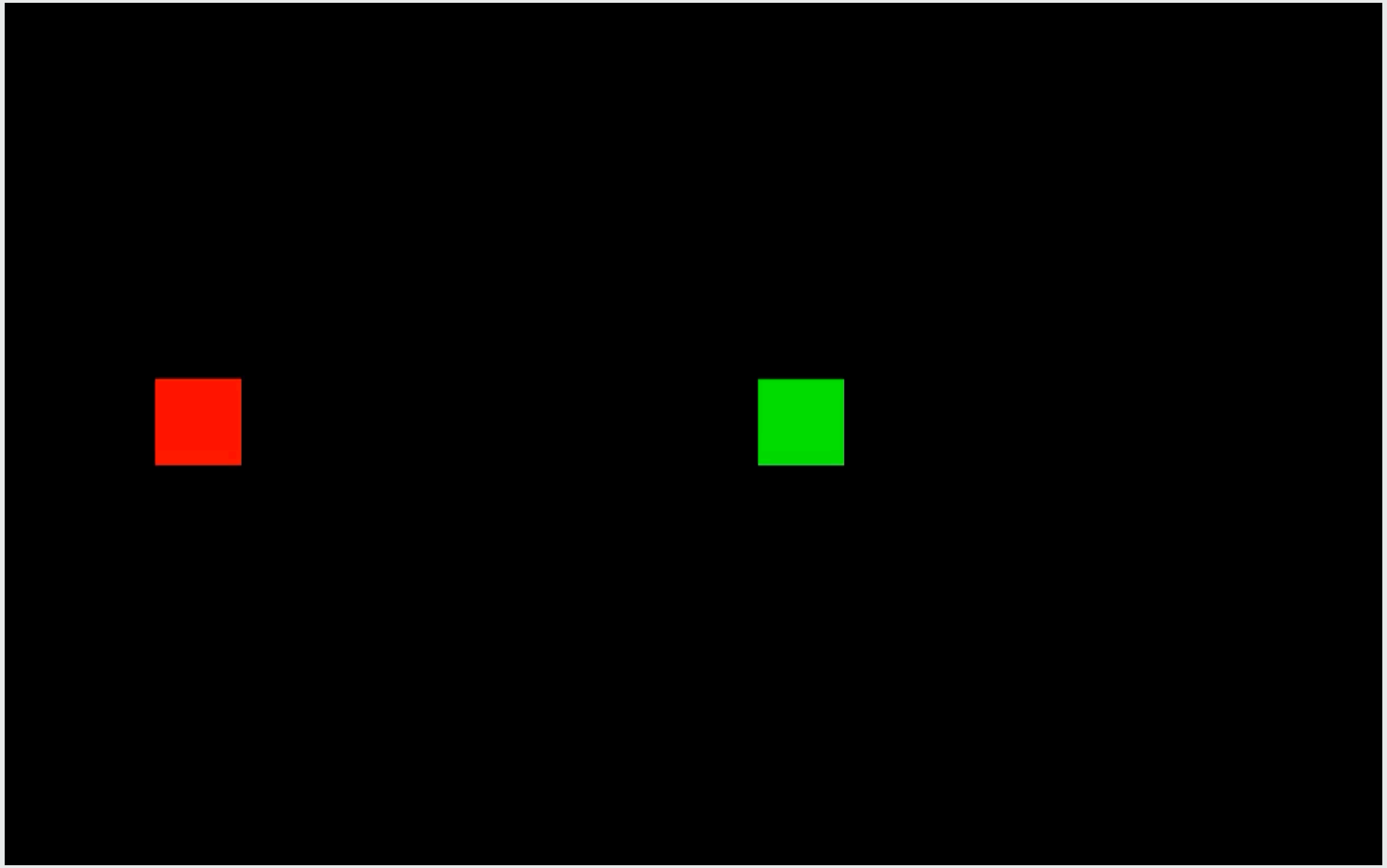
```
from expyriment import design, control, stimuli

...

square = stimuli.Rectangle(size=(50, 50), colour=(0, 0, 255))

...

square.present(clear=True, update=False)
fixation.present(clear=False, update=True)

exp.clock.wait(500)

square.present(clear=True, update=True)
```

Solve Exercise 2

Exercise 2: Two squares

```
from expyriment import design, control, stimuli

...

square_size = (50, 50)

left_square = stimuli.Rectangle(
     size=square_size,
     colour=(0, 0, 255),
     position=(-100, 0)
   )

...

left_square.present(clear=True, update=False)
right_square.present(clear=False, update=True)
```

Solve Exercise 3A



Exercise 3A: Michottean launching

```
# Distance to travel = Initial distance between objects
displacement_x = 400

# Set speed
step_size = 10 # pixels per update

# Move left square until collision
while right_square.position[0] - left_square.position[0] < square_length:
   left_square.move((step_size, 0)) # (move-x, move-y)
   # Don’t forget to update the screen!
   ...

# Move right square the same amount
while right_square.position[0] < displacement_x:
   right_square.move((step_size, 0))

# A better way (expyriment): r_square.distance(l_square) < square_length
```

Push your work to GitHub

Homework

Exercises 3B–E: Play around with different parameters to probe your causal perception

Exercise 3E: Launching function

Exercise 3F: Optional challenge

Exercises 4A–B: Shape, Text, and Line stimuli