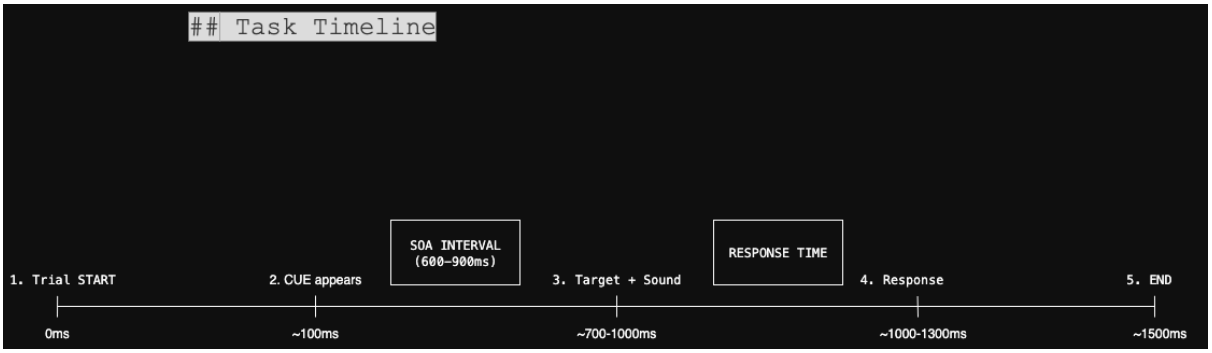
Task Timeline



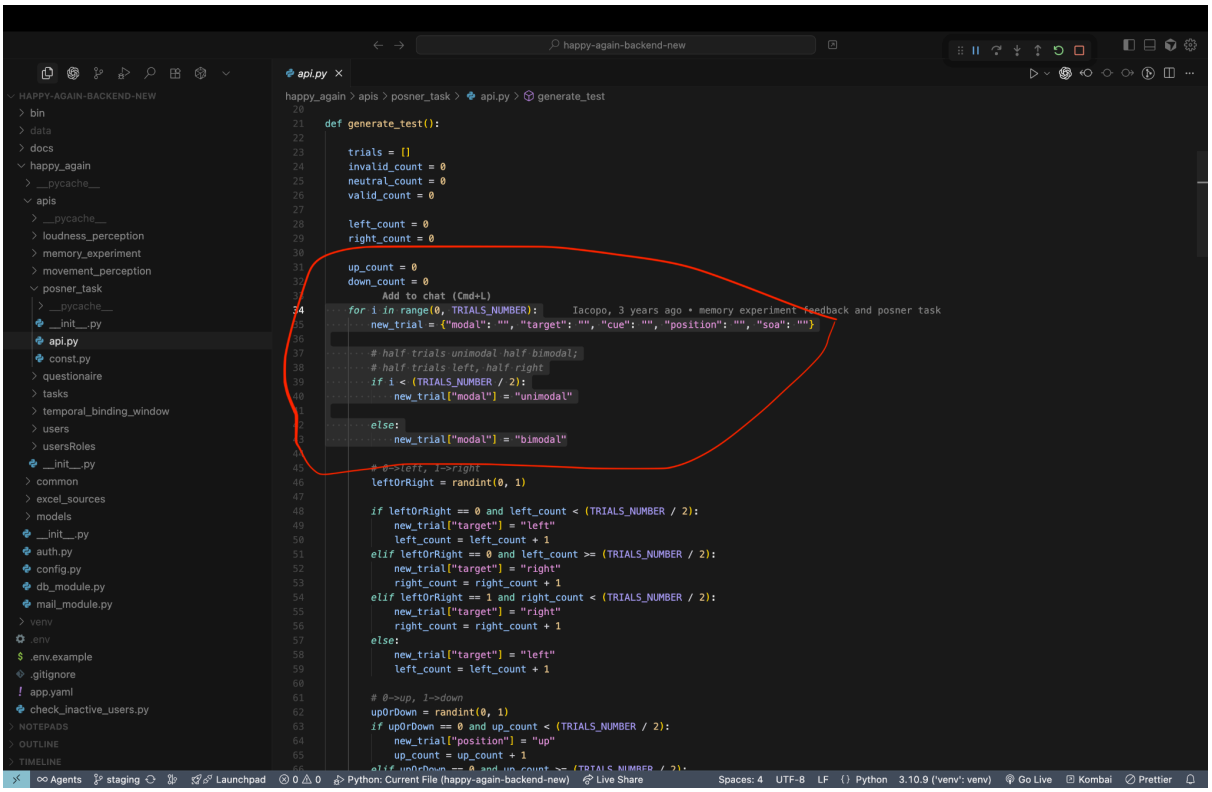
link to graph in google drive -> https://shorturl.at/MuEMI

What happens:
- **0ms**: Trial starts (empty screen)
- **~100ms**: CUE appears (arrows ←, →, or ↕)
- **600-900ms**: Target appears (left/right) + Sound (if bimodal)
- **~1200ms**: User presses UP or DOWN button
- **END**: Data saved

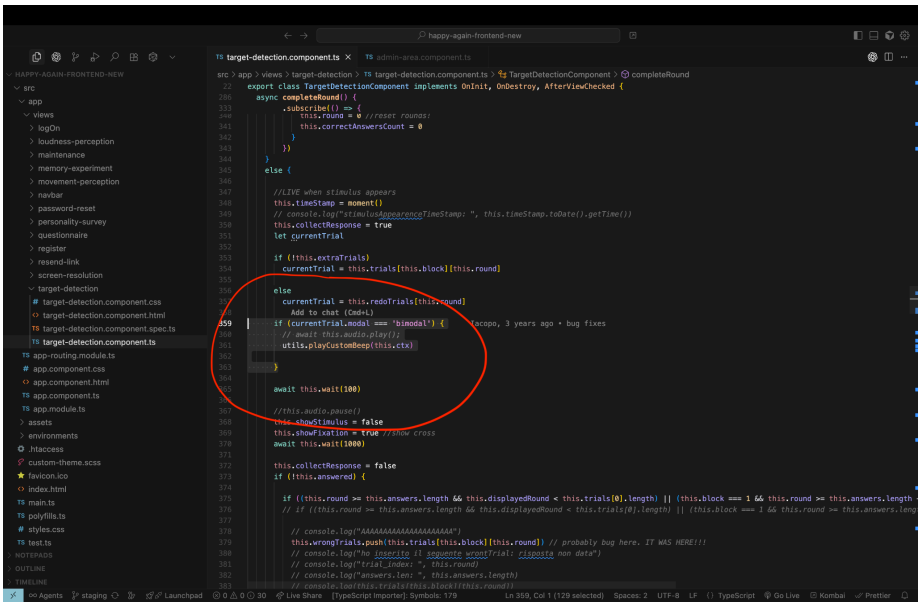
Cue Types:
- **Valid**: ← points left, target appears left = Fast response
- **Invalid**: → points right, target appears left = Slow response
- **Neutral**: ↕ no direction = Medium response

CSV Columns

Encodings Overview
Modal defines the sensory modality of stimulus presentation:
- **Unimodal (1)**: Visual-only stimulus
- **Bimodal (2)**: Visual + auditory stimulus (3500 Hz beep)
Half of trials are unimodal, half are bimodal. Determined by server during trial generation.

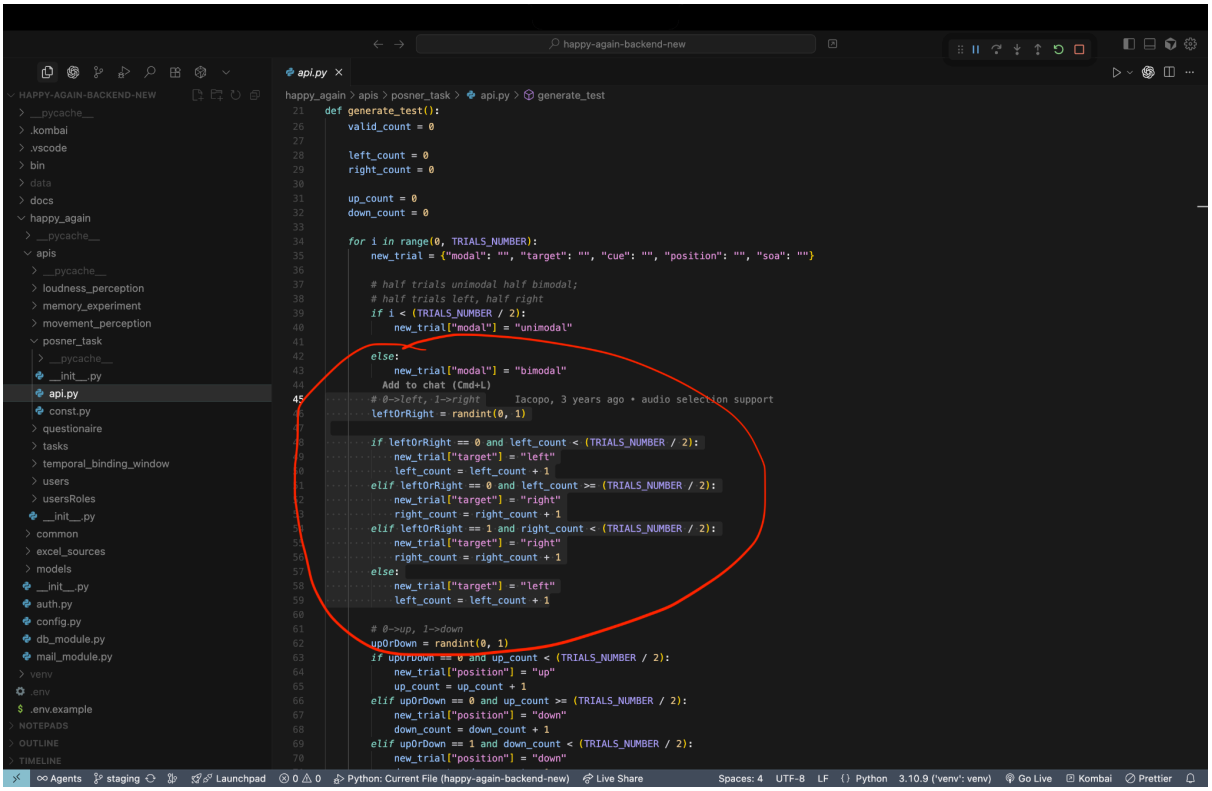


- This line randomly shuffles the list of generated trials so their order is unpredictable when sent to the frontend. As a result, unimodal and bimodal trials are mixed rather than appearing in fixed blocks.

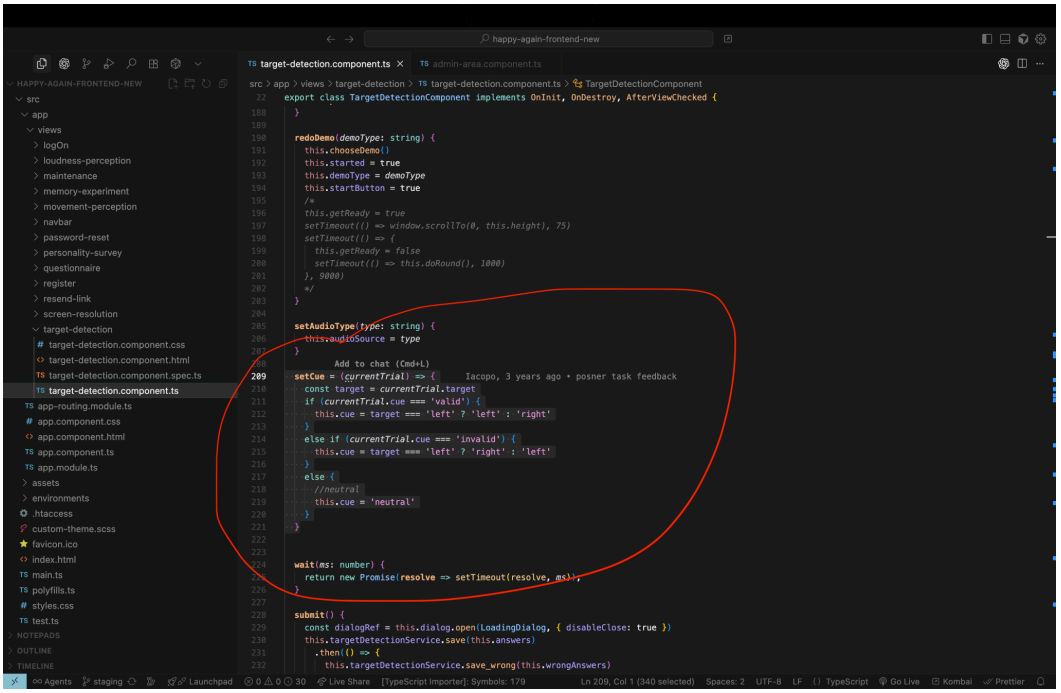


Target defines the spatial location of the visual stimulus:
- **Left (0)**: Stimulus appears on the left side of screen
- **Right (1)**: Stimulus appears on the right side of screen

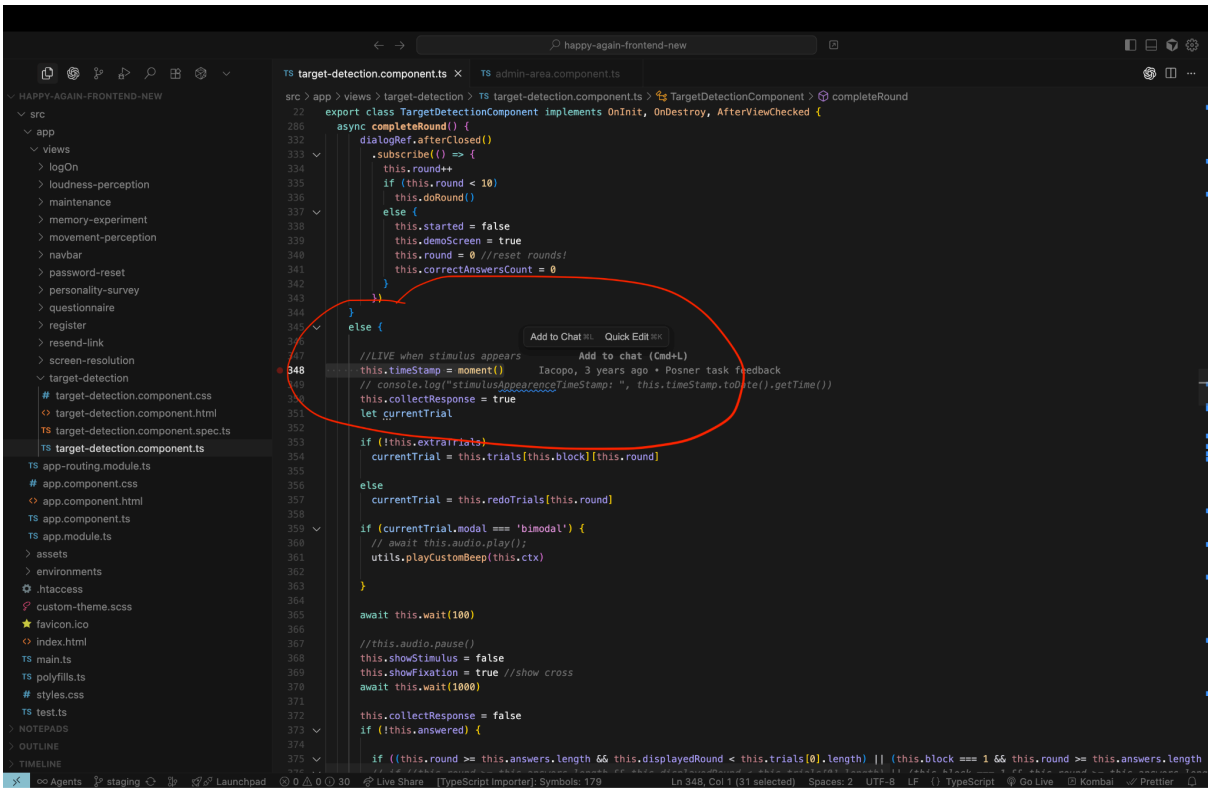
Half of trials have left target, half have right target. Determined by server during trial generation.



How set: the server randomly assigns left/right while enforcing equal counts; afterwards trials are shuffled, so left/right appear in random sequence.
Purpose: used to determine cue validity (valid/invalid/neutral) and analyze reaction times by side.

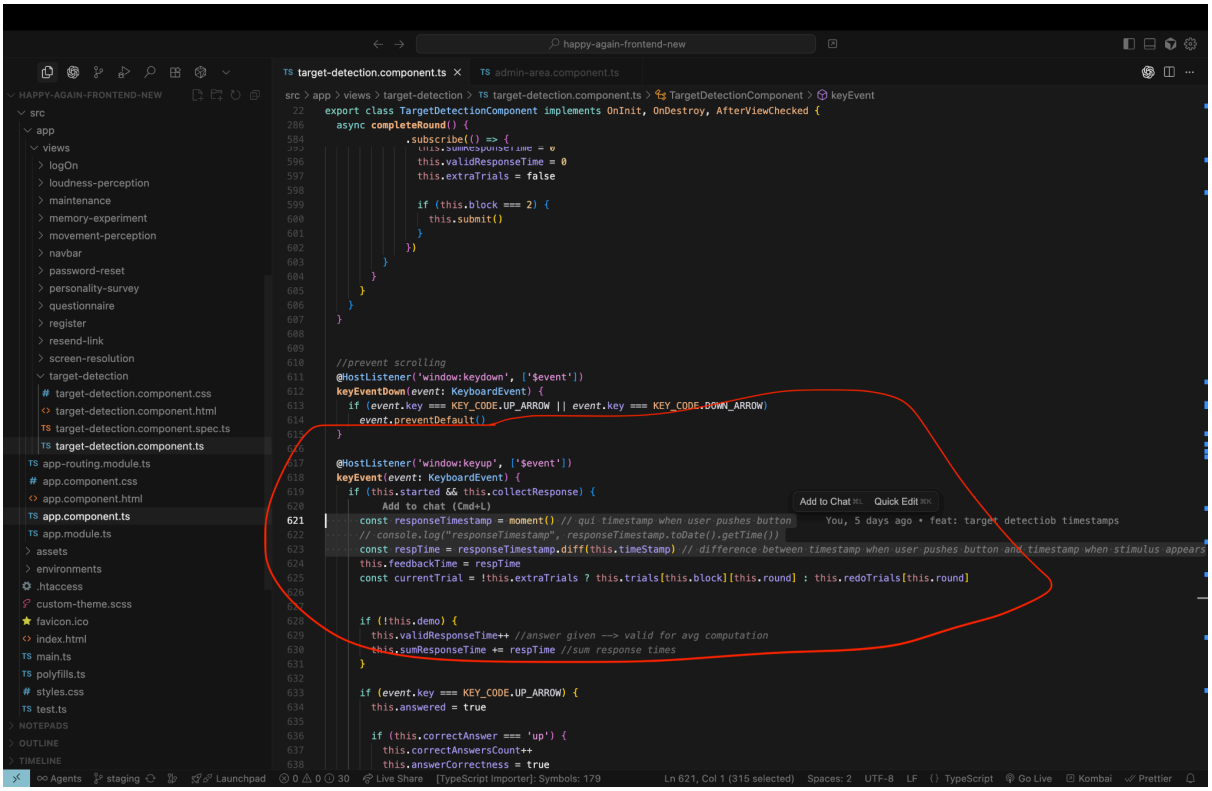


Response time - time in milliseconds between stimulus appearance and user button press. Measures reaction speed and attention performance.

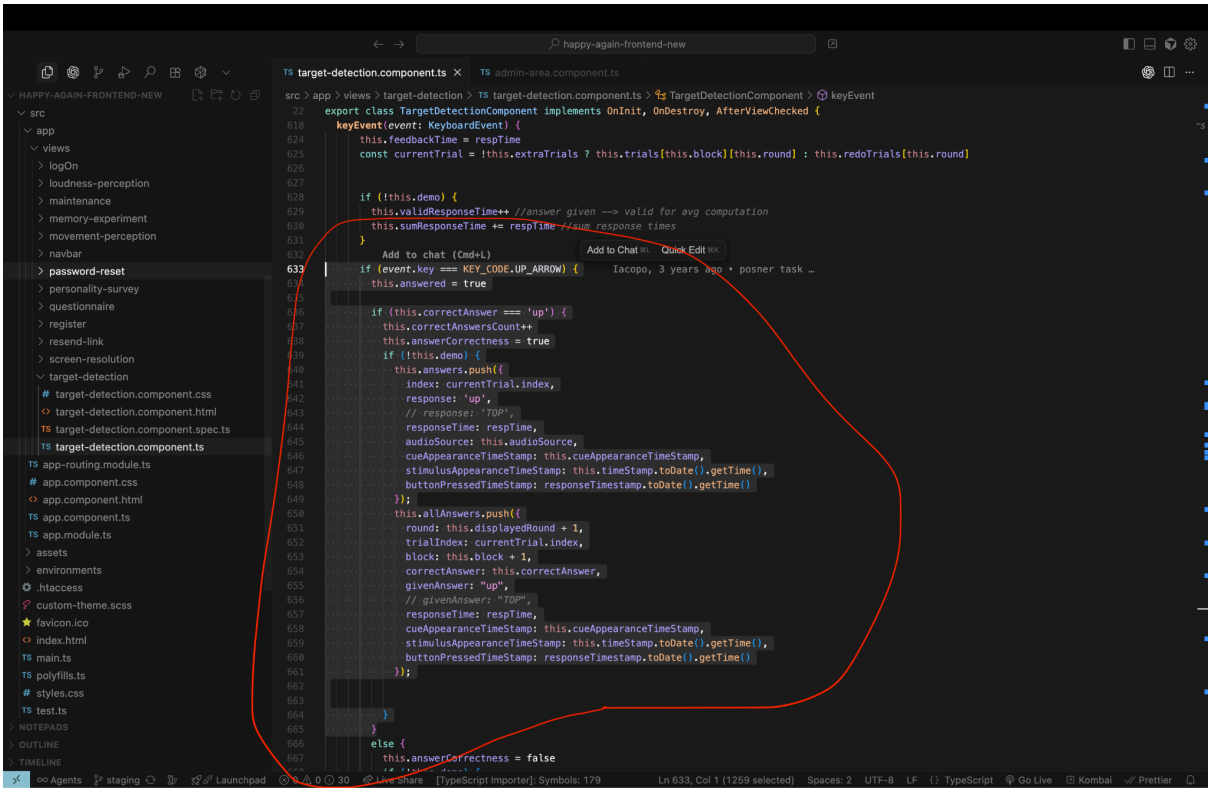


Process:
1. **`this.timeStamp`** - recorded when stimulus appears (line 348)
2. **`responseTimestamp`** - recorded when user releases key (line 621)
3. **`respTime`** - calculated difference in milliseconds

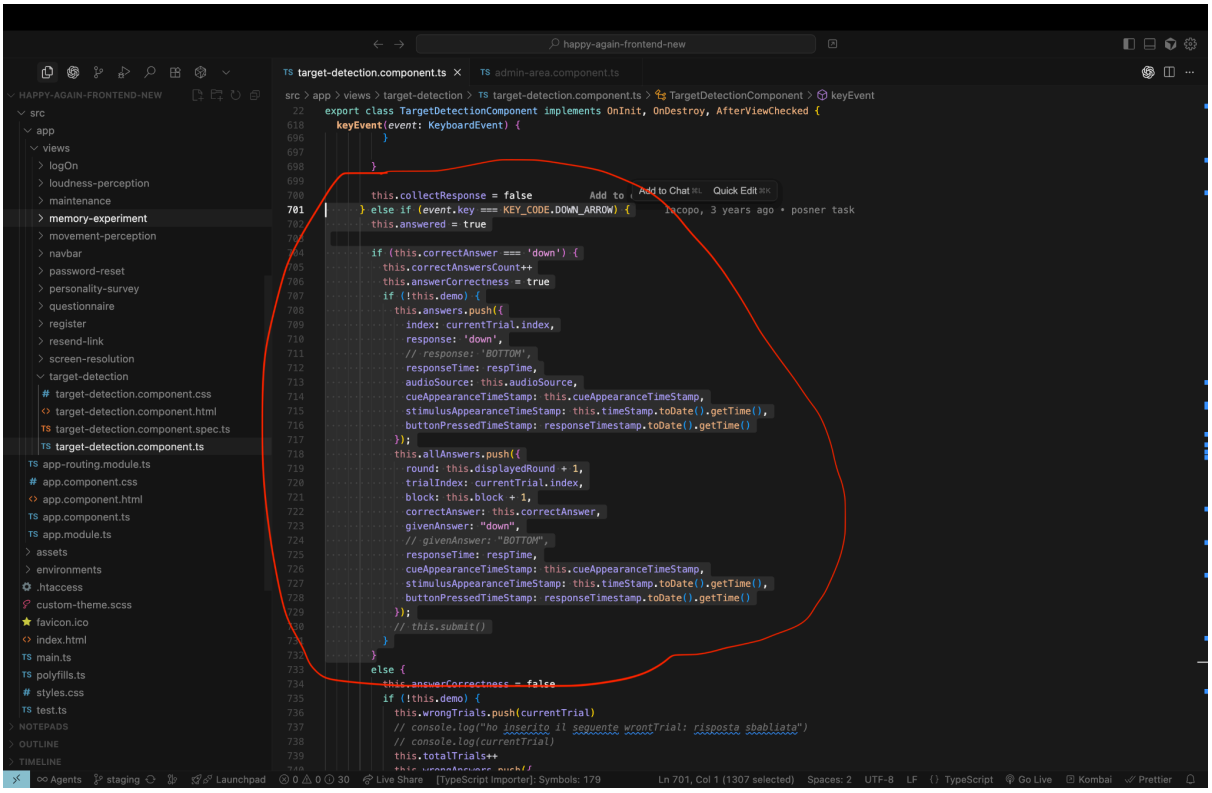
Result: Reaction time in milliseconds measuring attention performance.



Response - user button press:
- **Up (1):** UP arrow key
- **Down (0):** DOWN arrow key

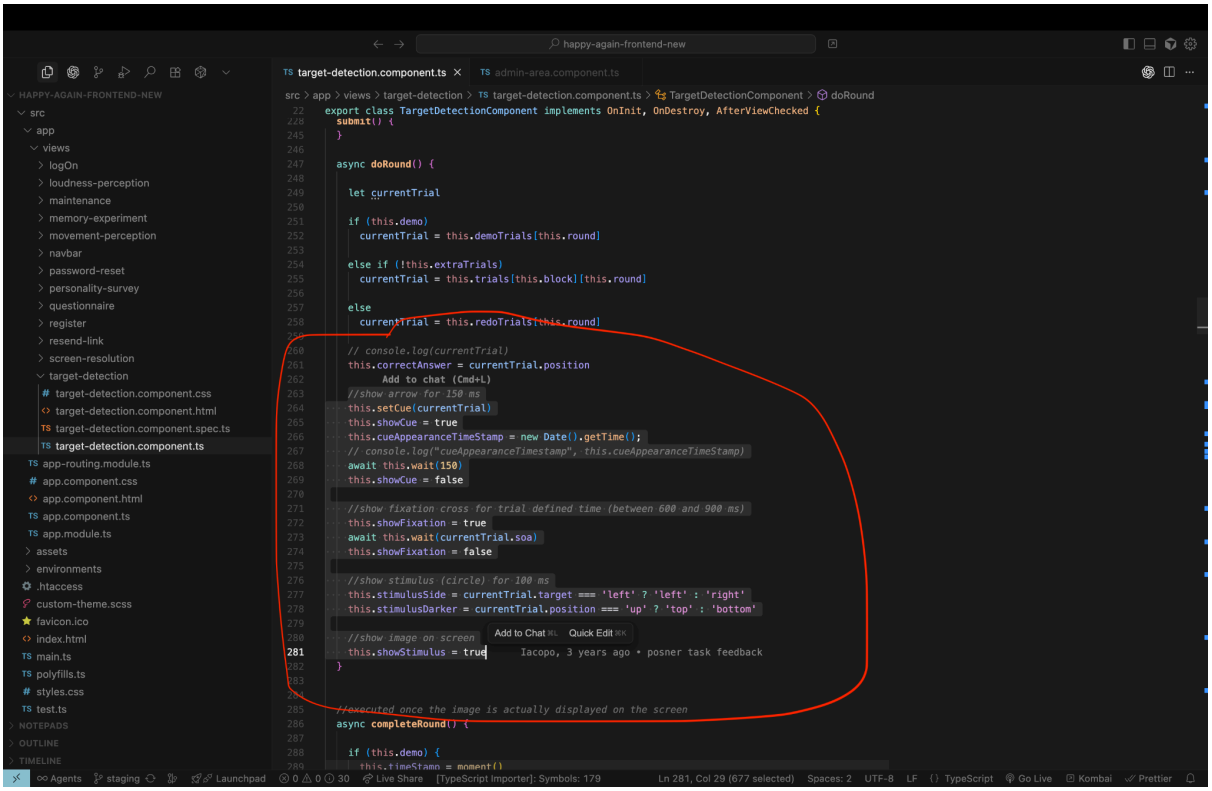


Process: Directly captures which arrow key the user pressed in response to the stimulus. Value comes from keyboard event and is stored in trial data.



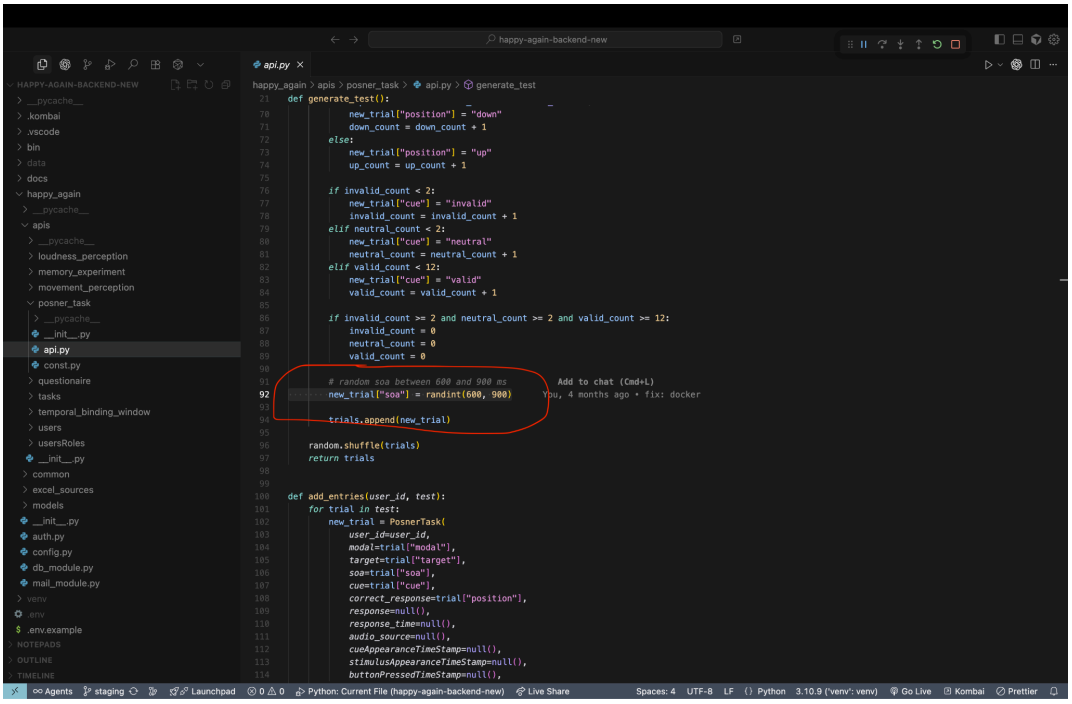
SOA (Stimulus Onset Asynchrony) - random delay between cue and stimulus:
- **Range**: 600-900 milliseconds
- **Purpose**: Prevents timing predictability
- **Generated**: Randomly by server for each trial
- **Usage**: Controls fixation cross display duration

Variable timing ensures participants cannot predict stimulus appearance.

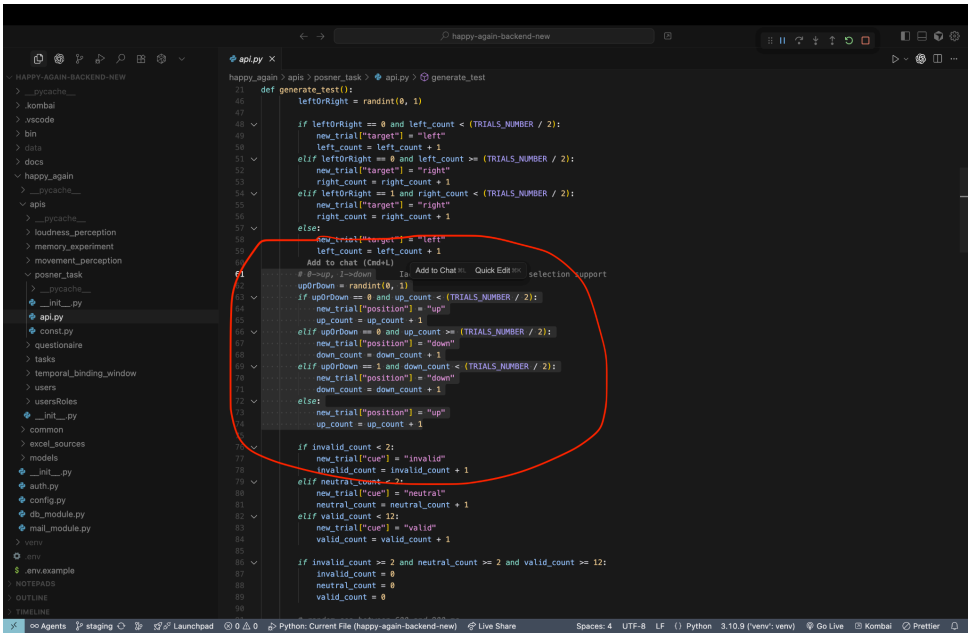


Process: Server generates random SOA (600-900ms) for each trial. Frontend uses this value to control how long the fixation cross is displayed before showing the stimulus.

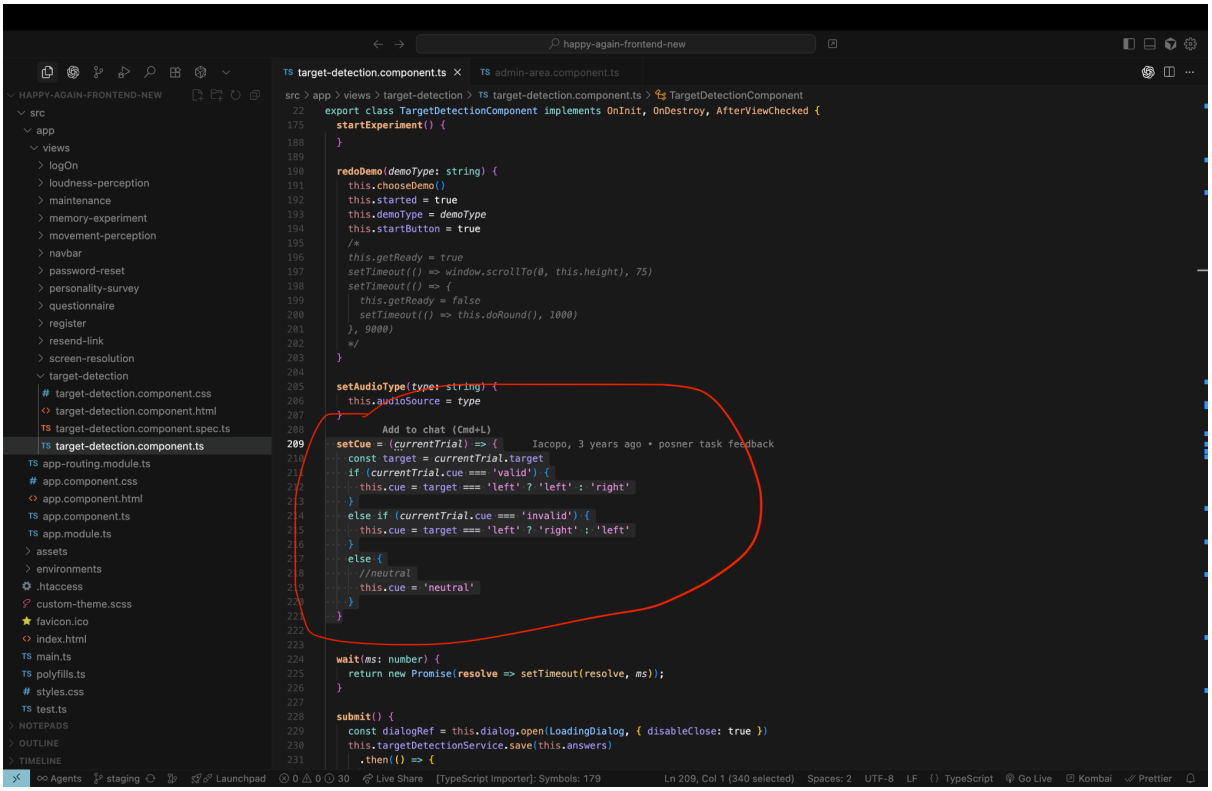
Purpose: Prevents timing predictability, ensuring participants cannot anticipate stimulus appearance.

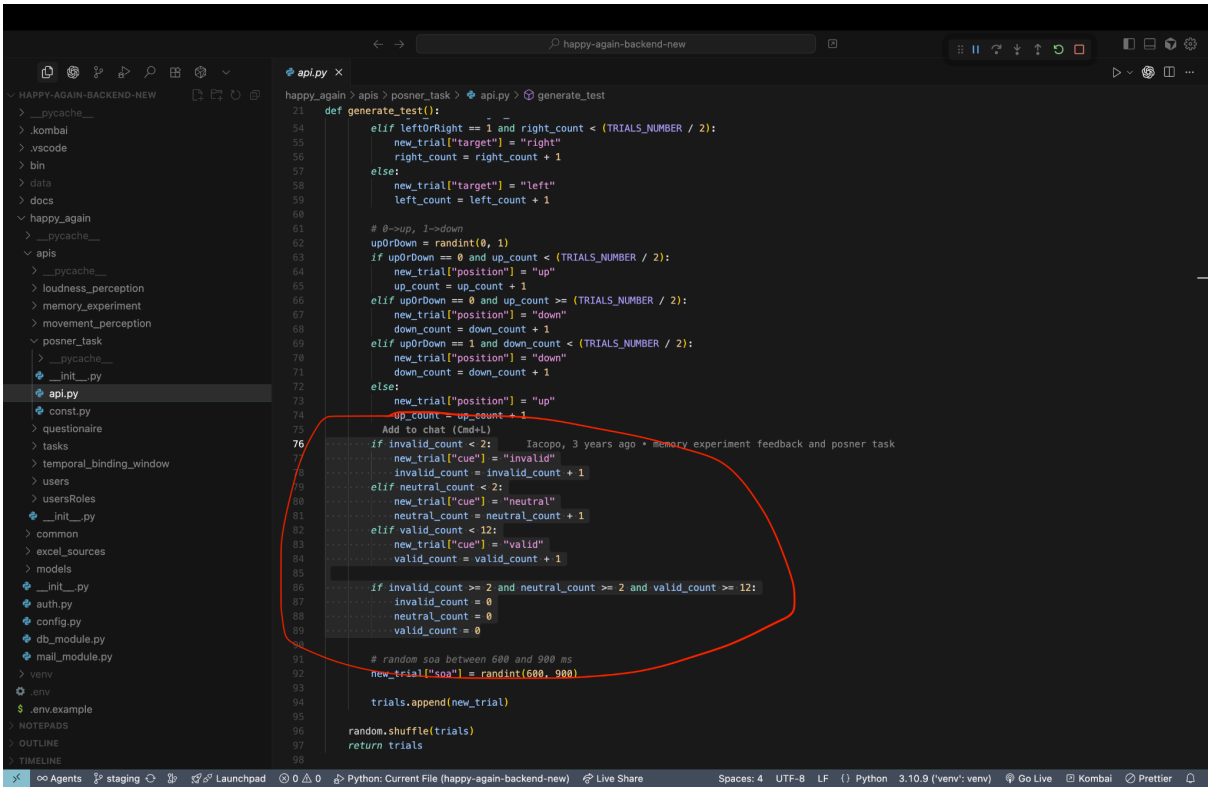


Correct response - expected answer based on stimulus position:
Up (1): Stimulus circle darker on top
Down (0): Stimulus circle darker on bottom
What it means: the expected key the participant should press on this trial — "up" or "down".
How it's set: generated on the server during test generation and balanced 50/50 across the session.

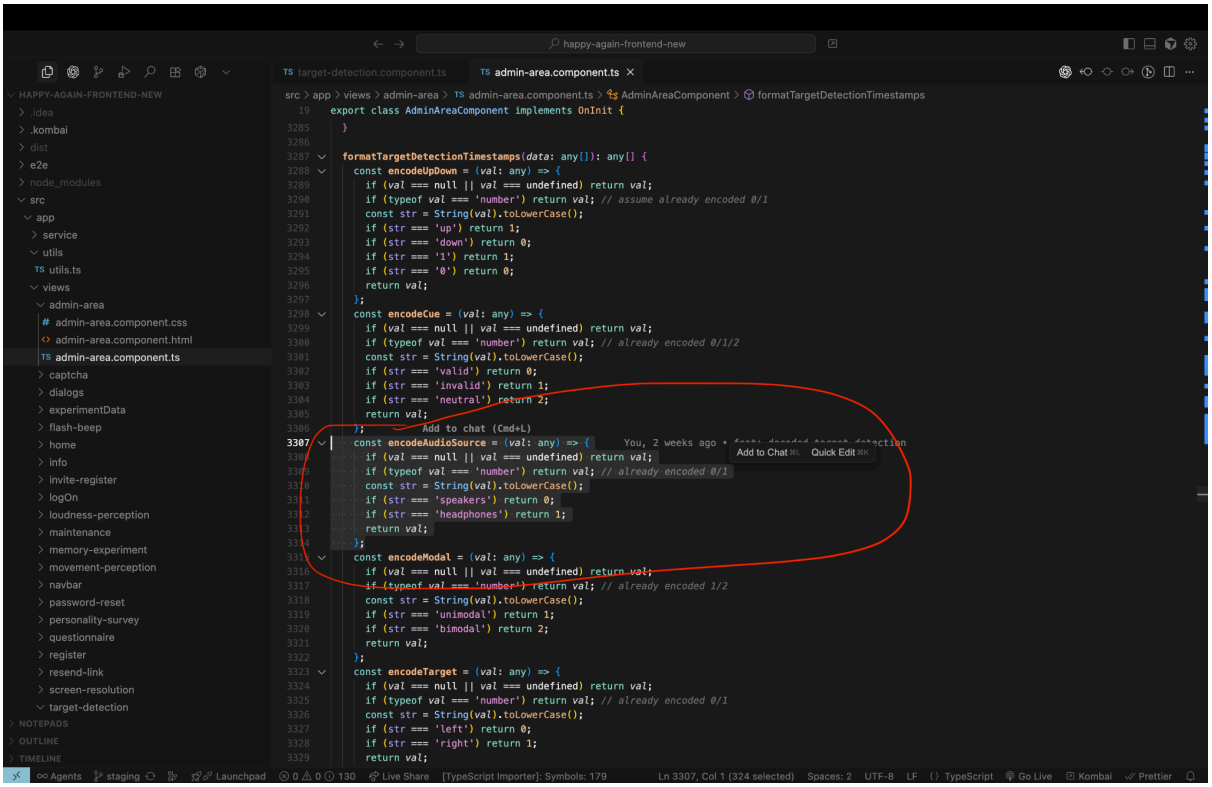


Cue - directional arrow hint before stimulus:
Valid (0): Arrow points toward stimulus location
Invalid (1): Arrow points away from stimulus location
Neutral (2): Both arrows shown (no directional hint)
Purpose: Tests attention and cue processing effects on reaction time.

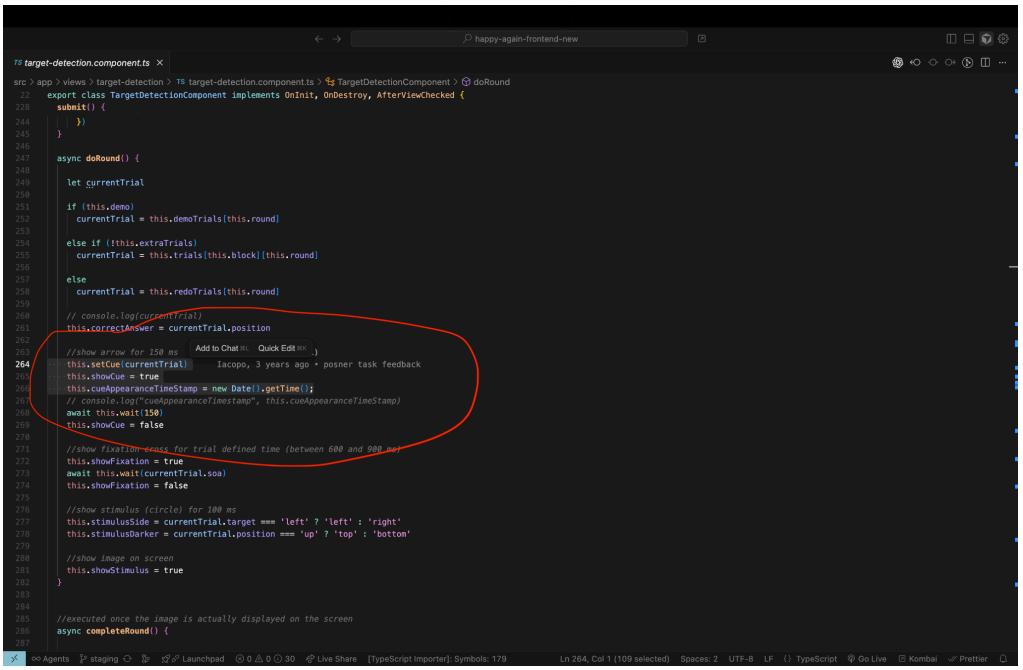




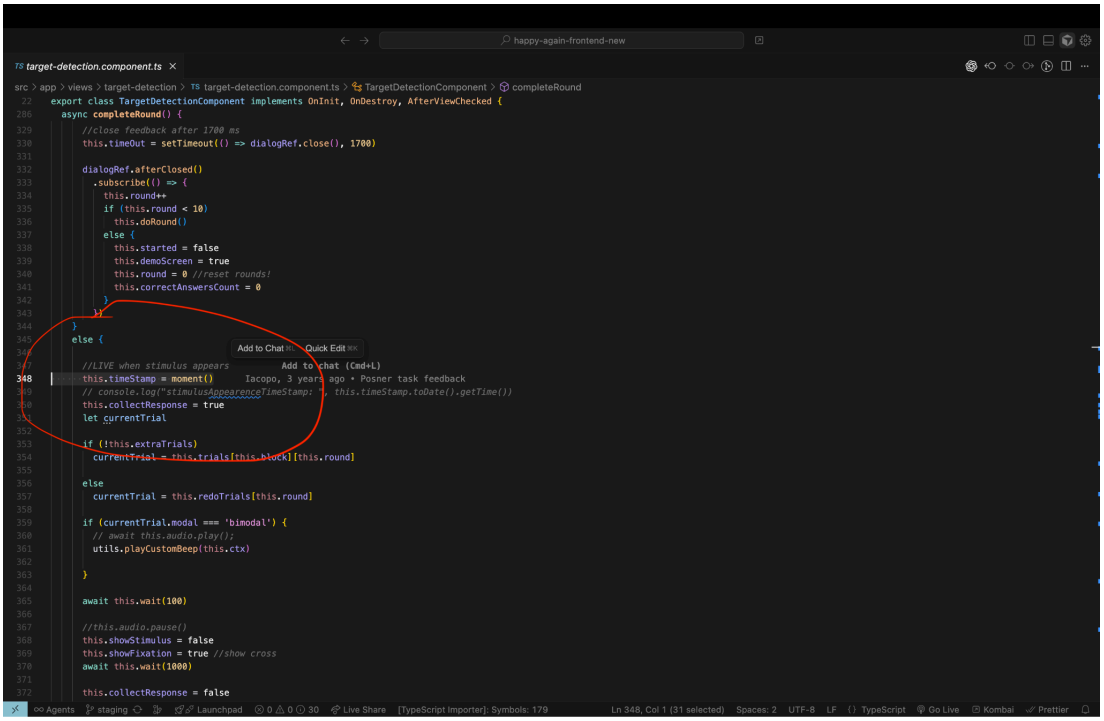
Audio source - user's audio device choice:
Speakers (0): External speakers selected
Headphones (1): Headphones selected
Selected by user before experiment starts via radio buttons.



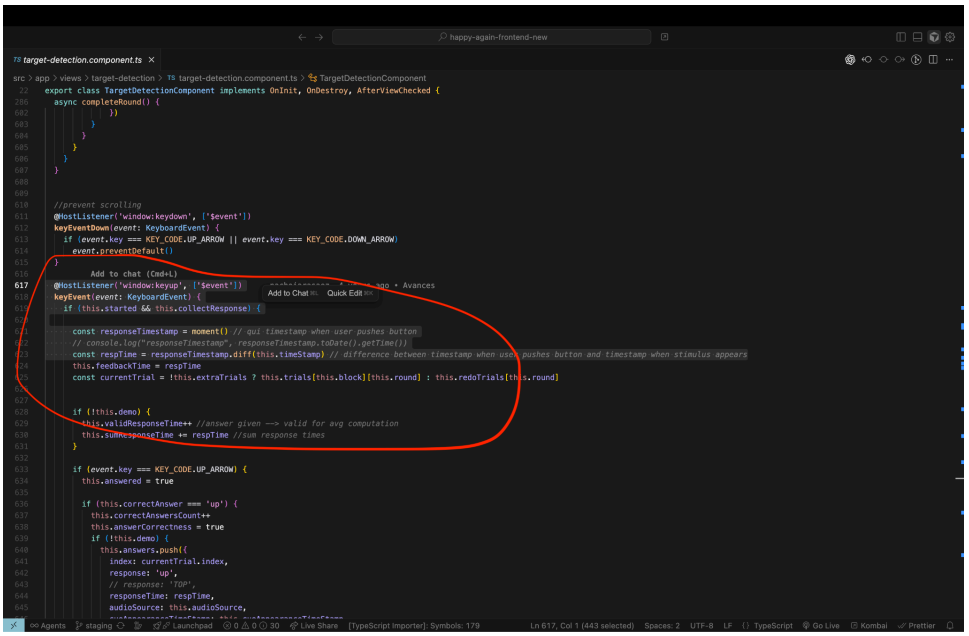
Cue appearance timestamp - Exact moment when directional cue (arrow) appears on screen
Format: Unix timestamp in milliseconds
Recorded: Immediately after cue display starts (line 266)
Purpose: Measures cue presentation timing for SOA calculations
Captured `1703123456789` → 12/21/2023, 14:30:56



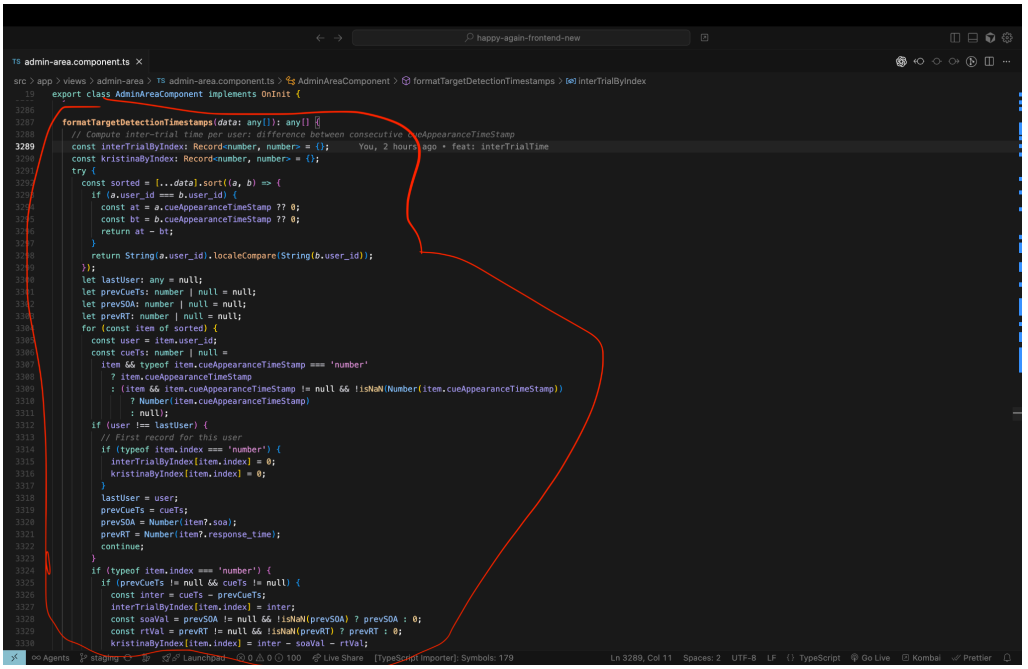
Stimulus Appearance Timestamp
Records: Exact moment when target stimulus (arrow) appears on screen
Format: Unix timestamp in milliseconds
When: Immediately after stimulus display starts (lines 289, 348)
Purpose: Marks stimulus onset for response time calculations
Example: `1703123456789` → 12/21/2023, 14:30:56



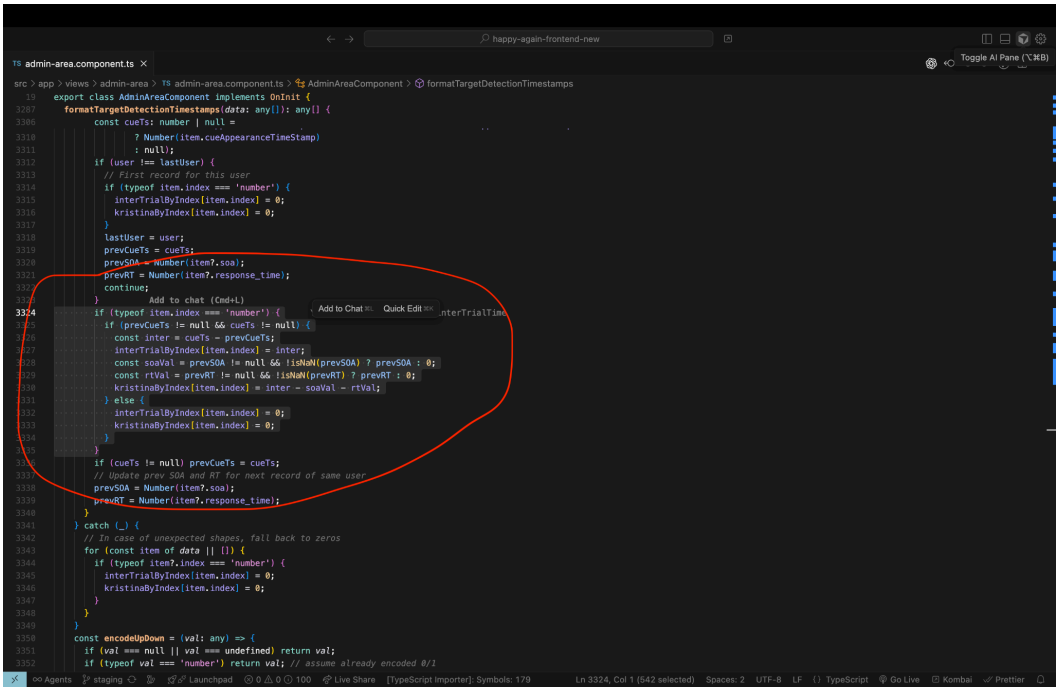
Button Pressed Timestamp
Records: Exact moment when user presses keyboard key (↑ or ↓)
Format: Unix timestamp in milliseconds
When: Immediately when key is pressed during response collection (line 621)
Purpose: Measures response timing for reaction time analysis
Example: `1703123456789` → 12/21/2023, 14:30:56



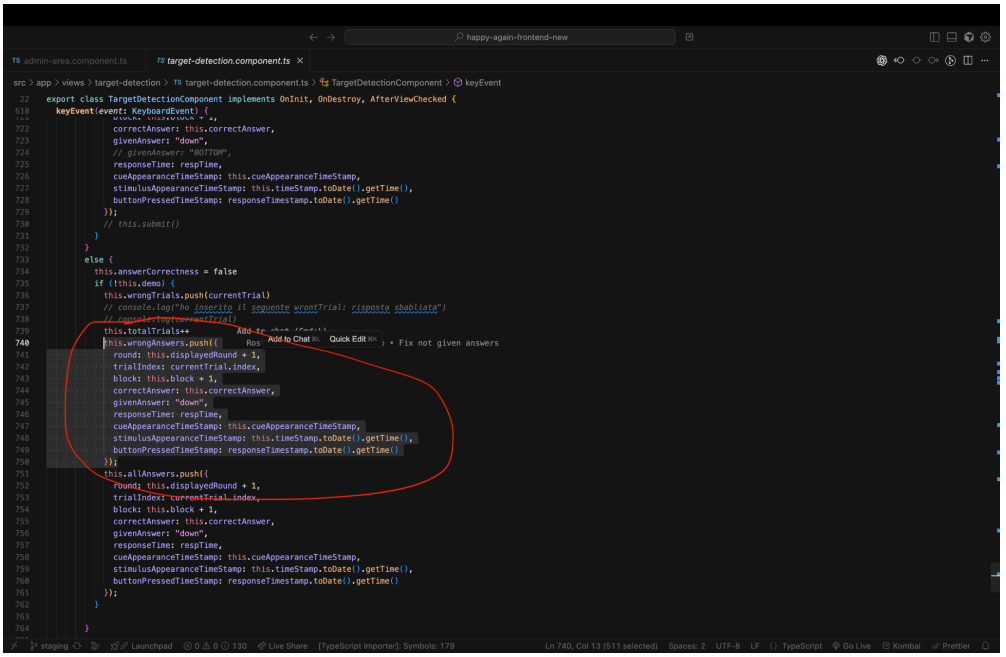
interTrialTime
Records: Time gap between consecutive trials for the same user.
Format: Milliseconds (number).
When: For each record after the first per user; first record per user is 0.
Formula: current cueAppearanceTimeStamp − previous cueAppearanceTimeStamp



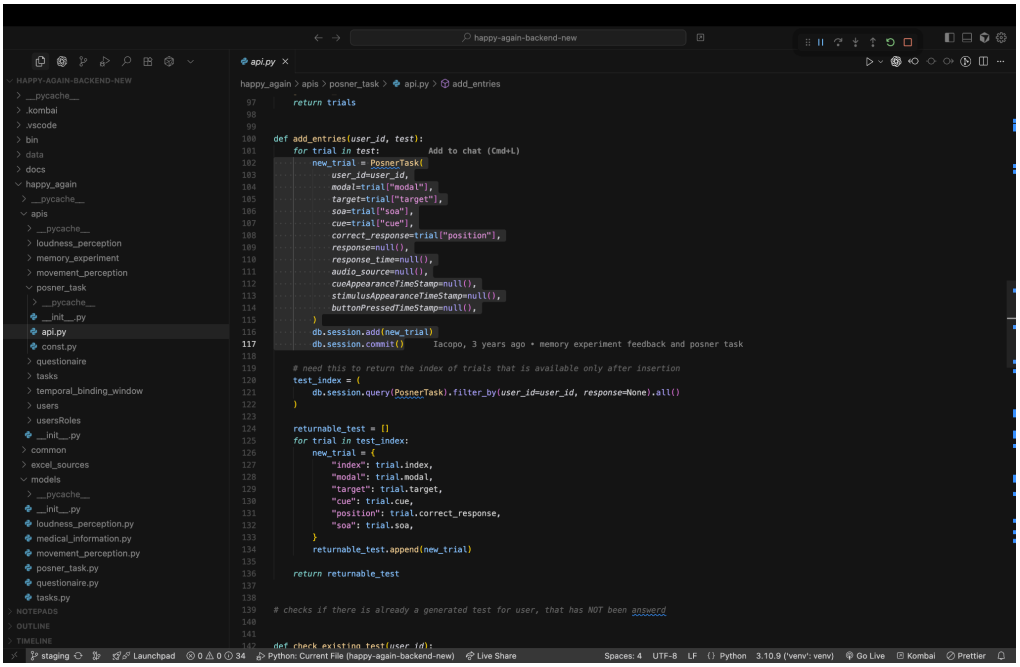
kristina
Records: Inter-trial time adjusted by previous trial's SOA and response_time.
Format: Milliseconds (number).
When: For each record after the first per user; first record per user is 0.
Formula: interTrialTime(current) − SOA(previous) − response_time(previous).



round
Meaning: Trial attempt number
Example: 3, 5, 7, 9, 25, 43, 50
Logic Tracks how many times user tried to complete the task. Each new session or restart increases the round number.



trial_index
Meaning: Original trial ID from main posner_task table
Example: 1027, 1029, 1031, 1033
Logic Links wrong answer back to the original trial in target_detection_correct.csv. When user gives wrong answer, system saves the index of that specific trial.



block

Meaning: Trial block number

Example: 1

Logic Groups trials into blocks for analysis. Most records show value 1, meaning all trials belong to one block. Used for performance analysis by blocks, 1 block = 128 trials