

a. What will be printed by the code snippet in non-strict mode?

1. First call to `user.display()`:

- `str = "Greetings, "`
- Inside the `display` method, `this.firstName` refers to the `user` object since `display` is called as `user.display()`. Therefore, `this.firstName` will be `"John"`.
- The first `console.log(str, this.firstName)` will print:
"Greetings, John"
- After that, `show("hi")` is called inside the `display` method. In non-strict mode, since `show` is called directly (without an object context), `this` inside `show` refers to the **global object** (window in browsers).
 - `this.lastname` in the global context is undefined (since `lastname` does not exist on the global object), and the `msg` is `"hi"`.
 - Therefore, the second `console.log(msg + " " + this.lastname)` inside `show` will print:
"hi undefined"

2. Call to `show.call(user, "hello")`:

- `show` is called with `.call(user)`, meaning `this` inside the `show` function will be explicitly set to the `user` object.
- `msg = "hello"`, and `this.lastname` will now refer to `user.lastname`, which is `"Smith"`.
- The third `console.log(msg + " " + this.lastname)` inside `show` will print:
"hello Smith"

b. Lexical Environment Diagram or Listing

1. Global Execution Context Creation:

- **Lexical Environment (LE):** The `let` and function declarations are stored.
 - `str`: uninitialized
 - `user`: uninitialized
 - `show`: function definition
- **Outer:** null (since it's the global context)
- **Temporal Dead Zone (TDZ):** `str`, `user`

2. Global Execution Context Execution:

- **Lexical Environment (LE):**

- str: "Greetings, "
 - user: { firstName: "John", lastname: "Smith", display: function }
 - show: function
- **Outer:** null
- **TDZ:** Cleared for str and user

3. user.display() Function Execution Context Creation:

- **Lexical Environment (LE):**
 - this: user (because it's called as user.display())
 - str: "Greetings, " (referenced from the global environment)
 - this.firstName: "John"
- **Outer:** Global

4. user.display() Function Execution:

- The first console.log prints: "Greetings, John"
- show("hi") is called.

5. show("hi") Function Execution Context Creation:

- **Lexical Environment (LE):**
 - msg: "hi"
 - this: **global object** (window in browsers) since show is called without an object context.
- **Outer:** Global

6. show("hi") Function Execution:

- The second console.log prints: "hi undefined"

7. show.call(user, "hello") Function Execution Context Creation:

- **Lexical Environment (LE):**
 - msg: "hello"
 - this: user (explicitly set by .call(user))
- **Outer:** Global

8. show.call(user, "hello") Function Execution:

- The third console.log prints: "hello Smith"