

## Python Day 2 Advanced Recap - Key Concepts

### 1. String Reversal - Multiple Ways

- `[::-1]` -> fastest and cleanest
- `reduce(lambda acc, ch: ch + acc, s)` -> reverse via left-fold
- `".join(reversed(s))` -> turn iterator into string
- Custom loop -> great for interviews

Takeaway: "Reversing strings is just rearranging characters - pick the clearest, not the cleverest."

### 2. Iterators, Lazy Evaluation & `reversed()`

- Lazy objects like `reversed()`, `map()`, `filter()` don't produce data immediately
- Must use: `list()`, `join()`, or loop to consume them
- `str(reversed(...))` just gives a memory address

Takeaway: "Lazy objects are like vending machines - they only give results when asked."

### 3. `reduce()` - Power Pattern

- Syntax: `reduce(lambda acc, next: ..., iterable, initializer)`
- `acc/next` can be int, list, set, dict, tuple

Takeaway: "Reduce folds a list into a single answer - lambda controls memory updates."

### 4. `isalpha()` vs `ord()` for Pangram Check

- `ord(ch)` in `range(97,123)` -> valid but cryptic
- `ch.isalpha()` -> clean
- Pangram: `set(ch for ch in s.lower() if ch.isalpha()) == set(a-z)`

Takeaway: "When checking letters, think `isalpha()` - when tracking seen, think like DP table."

### 5. Join Cleaned List of Names

- join() combines list of strings into one
- Always strip() each name, and filter out empty ones

Takeaway: "Clean before you join - strip() and filter empty names before gluing."

## 6. Debugger Error on defaultdict

- Not a bug - PyCharm can't always inspect .default\_factory
- Use dict(defaultdict) for debugging

## 7. Bonus: reduce\_right()

- Simulate reduceRight by doing: reduce(fn, reversed(data), initializer)

## Growth Mindset Moments

- DP-like thinking with 26-length frequency array
- Differentiated Any vs Union vs Optional
- Understood why str(reversed()) fails
- Asked when reduce() is ideal
- Clean, optimal implementations all day

## Final Takeaways

- reversed(): "Lazy mirror - use join() or list() to see inside"
- reduce(): "Your memory (acc) grows with every item (next)"
- isalpha(): "Ask the char: are you a letter?"
- pangram: "Seen all 26 letters? It's a pangram."
- join(): "String duct tape - but clean the strings first"