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Level 2 Business information technology
Data structure and algorithm

Stack Challenge Question: Push ["1", "2", "3", "4"], pop twice. Which is top?

The top will be 2 and here is the code

```
Push=[]
Push.append('1')
Push.append('2')
Push.append('3')
Push.append('4')
Push.pop()
Push.pop()
print(Push)
print('3.The bottom will be ' + Push[-1])
```

So if we have
1
2
3
4 *top*

If I pop and remove two Push which is 4,3 which is on top. it will be like this per stack theory
1
2 *top*

And answer is 2 which will be at top

Reflection on stack: Why stack supports undo history?
A stack supports undo because it follows the rule Last-In, First-Out (LIFO).
When you do actions, each one is placed on top of the stack. The last action you did is always the first one to undo.

 Example:
You type A → push on stack
You type B → push on stack
You type C → push on stack
Stack looks like: [A, B, C] (C is on top)

- If you press Undo, the program removes the top (C) first.
- Next undo removes B, then finally A.

That's exactly how undo works: you undo things in the reverse order you did them.

QUEUE QUESTIONS

• Challenge: Queue vs stack for traffic lights at junction. Which fits?

Queue fits better
Cars arrive one after another and wait in line. The first car that arrived is the first to pass when the light turns green. That's FIFO (First In, First Out) — just like a queue.

Stack does not fit
A stack works as LIFO (Last In, First Out). That would mean the last car to arrive at the junction goes first when lights change — which would cause chaos and accidents.

So for traffic lights at a junction, **queue** is the correct fit.

Reflection: Why FIFO matches fairness in roads?

FIFO matches fairness in roads because:

- Cars are served in the exact order they arrive.
- No car is "jumping the line" — the first to wait is the first to move.
- This avoids confusion and fights, since every driver knows their turn will come.
- It keeps traffic predictable and safe, unlike random or LIFO (where the last car would unfairly move first).

On the road, FIFO = fairness because it respects arrival time and treats all drivers equally.