

# [15-112] Lecture 16

## Lecture 16 Poll 1 (SOLO)

Given the set  $S = \{1, 2, 3, 4\}$ , which of the following is a syntax error? Check all that apply.

- A.  $S += \{5, 6\}$
- B.  $S.remove(5)$
- C.  $S.add([1, 2])$
- D.  $S || \{5, 6\}$
- E.  $T = S[2]$
- F.  $S.add((1, 2))$
- G. None of the above
- H. I don't know

## Lecture 11 Poll 1 (GROUP)

Given the set  $S = \{1, 2, 3, 4\}$ , which of the following is a **runtime error**? Check all that apply.

- A.  $S += \{5, 6\}$
- B.  $S.remove(5)$
- C.  $S.add([1, 2])$
- D.  $S || \{5, 6\}$
- E.  $T = S[2]$
- F.  $S.add((1, 2))$
- G. None of the above
- H. I don't know

## Lecture 11 Poll 1 (SOLUTION)

Given the set  $S = \{1, 2, 3, 4\}$ , which of the following is a syntax error? Check all that apply.

- A. `S += {5, 6}` -> `TypeError`
- B. `S.remove(5)` -> `KeyError`
- C. `S.add([1, 2])` -> `TypeError`  
(list unhashable)
- D. `S || {5, 6}` -> **Syntax Error**
- E. `T = S[2]` -> `TypeError`  
(set not subscriptable)
- F. `S.add((1, 2))` -> No Error

## Name Error

$\downarrow$   $+=$   $\downarrow$   
 $\downarrow$   $\downarrow$   $\downarrow$

↳ name not defined

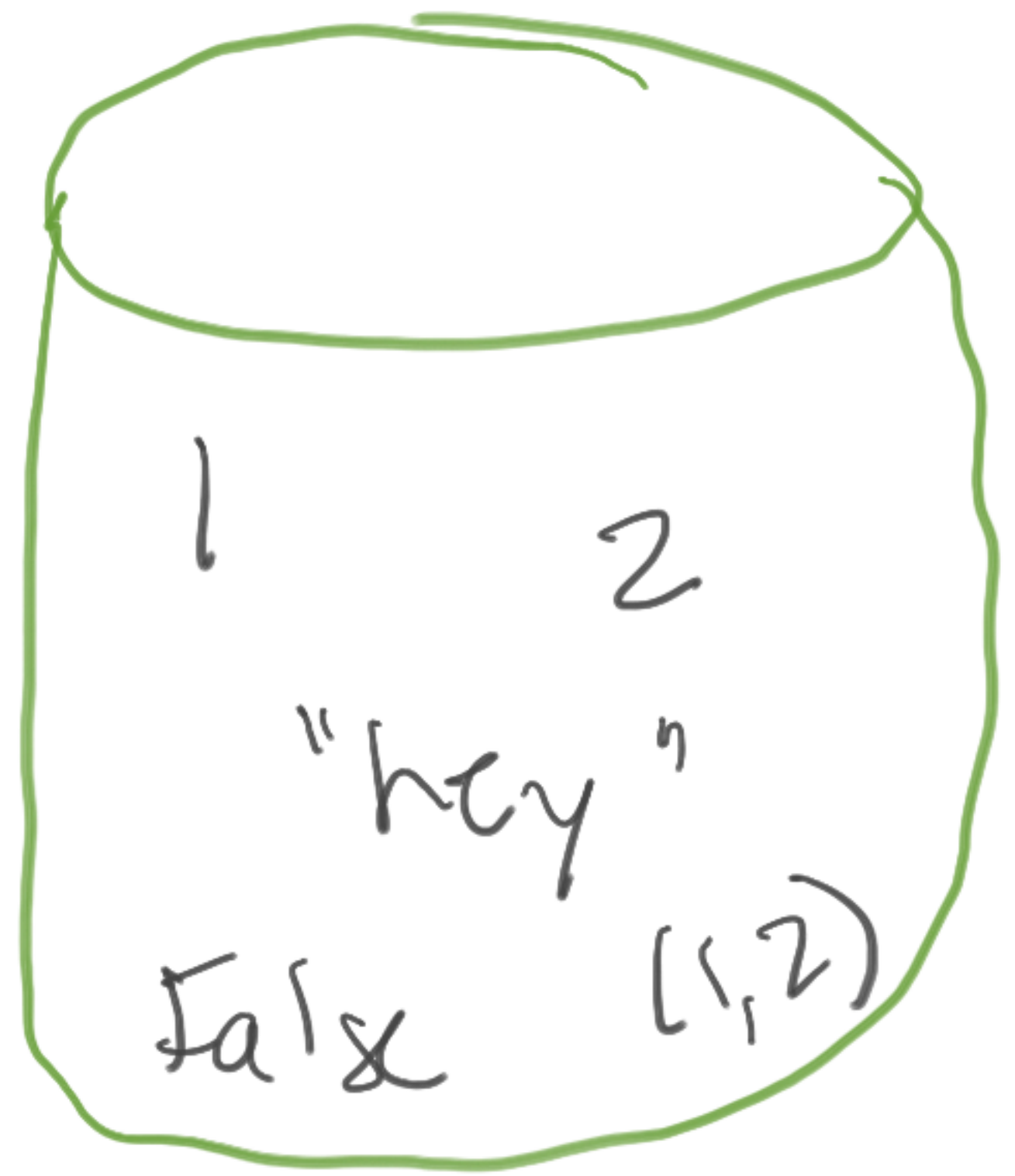
## Type Error

↳ wrong args to a func

↳ trying to do operation on  
some thing that can't

## Key Error

# sets are a bag of immutable objects



sets are ..

↳ unordered

↳ not indexable

↳ values are unique

"in" op:  
is fast

SETS ARE FAST

# set methods

## mutating

add

remove

## non mutating

intersection

union

difference

A & B

→ &

~~X~~

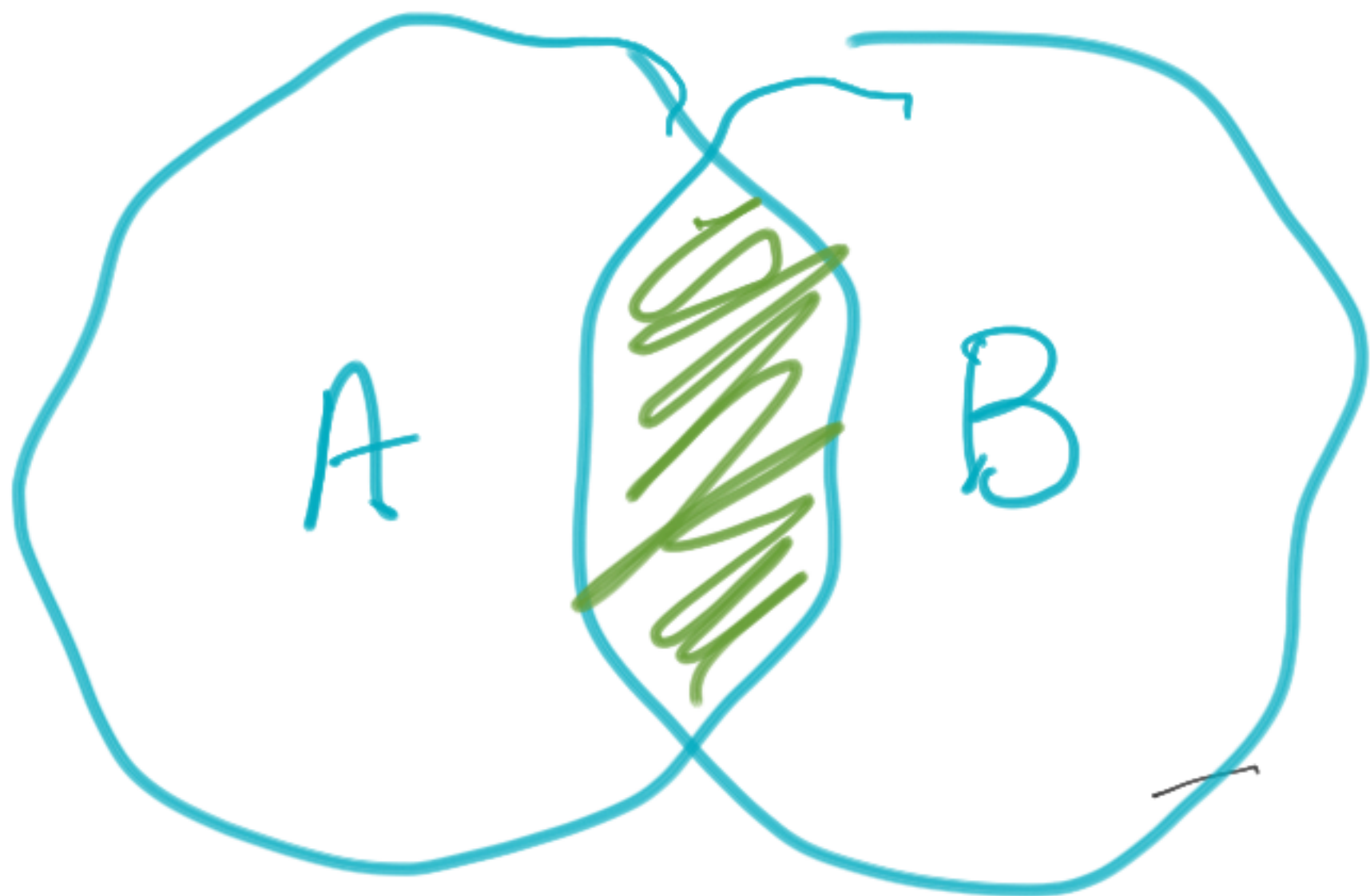
→ ∪

-

# Intersection

$$A = \{1, 2, 3, 4\}$$

$$B = \{3, 4, 5, 6\}$$



$$\{3, 4\}$$

A & B



Union

$$A = \{1, 2, 3, 4\}$$

$$B = \{3, 4, 5, 6\}$$



$A \cup B$

$$\{1, 2, 3, 4, 5, 6\}$$

difference

$$A = \{1, 2, 3, 4\}$$

$$B = \{3, 4, 5, 6\}$$



$A - B$

$$\{1, 2\}$$

$B - A$

$$\{5, 6\}$$

## Lecture 16 Poll 2 (SOLO)

What is the output of the following code?

```
d = {1:2, 1:3, 1:4}
print(d)
```

- A. {1:2, 1:3, 1:4}
- B. {1:2, 1:3}
- C. {1:2}
- D. {1:3, 1:4}
- E. {1:3}
- F. {1:4}
- G. {}
- H. I don't know

## Lecture 11 Poll 2 (GROUP)

What is the output of the following code?

```
d = {1:2, 1:3, 1:4}
print(d)
```

- A. {1:2, 1:3, 1:4}
- B. {1:2, 1:3}
- C. {1:2}
- D. {1:3, 1:4}
- E. {1:3}
- F. {1:4}
- G. {}
- H. I don't know

## Lecture 11 Poll 2 (SOLUTION)

What is the output of the following code?

```
d = {1:2, 1:3, 1:4}
print(d)
```

- A. {1:2, 1:3, 1:4}
- B. {1:2, 1:3}
- C. {1:2}
- D. {1:3, 1:4}
- E. {1:3}
- F. {1:4} -> ANSWER**
- G. {}
- H. I don't know

a dictionary is a mapping  
of unique keys to any values

keys in a dictionary are just a set!

keys are:

↳ immutable objects

↳ unique

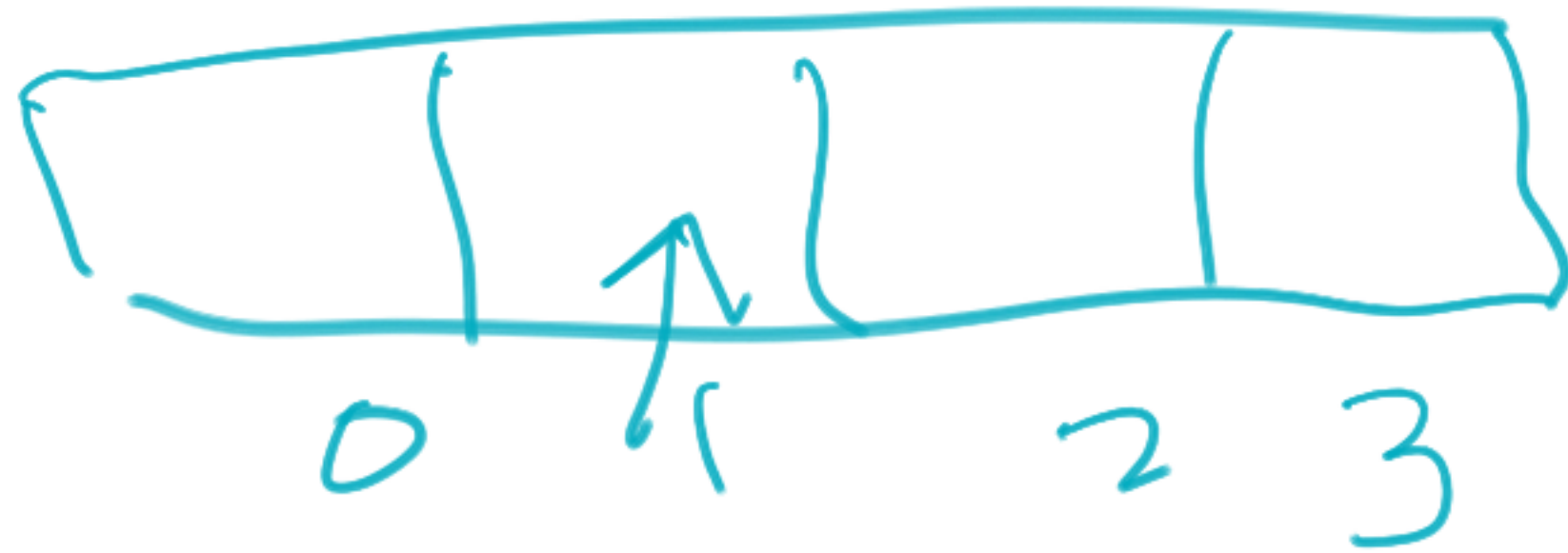
↳ unordered

↳ fast

"in" op  
fast!

key in d?

values can be anything



$\hookrightarrow [i]$

key: {1, 2, 3},  
po: [1, 2, 3]}

$\hookrightarrow ["key"] = 1$

dict methods

non mutating

• get (value, default)

↳ VERY HANDY

→ add change remove  
using indexing

→ not when looping over, always loops  
over keys!



hash table

hash (obj) %

buckets

⇒ place in table

|   |     |
|---|-----|
| 0 |     |
| 1 |     |
| 2 | 2 8 |
| 3 |     |
| 4 | 40% |
| 5 | 5   |

$$2 \% 6 = 2$$

$$40 \% 6 = 4$$

↳ possible to have multiple things in same row

★ sets and dicts implemented w/ hash table