# CSE 8A: Intro to Programming in Python Fall 2021

Lecture 16 - 2D list, tuples

UC San Diego

# **Topics**

- Nested loop review
- 2D list
- Tuple

## Review: Nested For Loops

How many times will "Live today!" be printed?

```
for i in range(2):
    for j in range(3):
        print("Live today!")
A) 2
B) 3
C) 5
D) 6
```

## Review: Nested For Loops

How many times will "Live for others!" be printed?

```
for i in range(2):
    print("Live for others!")
    for j in range(3):
        print("-----")
```

A) 2

B) 3

C) 5

D) 6

## Review: Nested For Loops

How many times will "Live for others!" be printed?

```
for i in range(2):
    for j in range(3):
        print("----")
print("Live for others!")
```

A) 2

B) 3

C) I

D) 6

### 2D List

- ID list can be viewed as a collection of things
- 2D list can be viewed as a grid of things
  - Table
  - Picture (what we focus on)

Example: 5 labs per student for 3 students grades = [[90, 91, 92, 93, 100], [20, 0, 0, 100, 100], [100, 100, 100, 0, 0]]

grades = [[90, 91, 92, 93, 100], [20, 0, 0, 100, 100], [100, 100, 100, 0, 0]]

Indexes	0	1	2	3	4
0	90	91	92	93	100
1	20	0	0	100	100
2	100	100	100	0	0

## **Exercise: 2d Lists**

#### What will be printed?

```
data = [[10, 20, 30, -1], [40, 50, 60, -2], [70, 80, 90, -3]]
print(data[1])
```

A) 20

B) [10, 20, 30, -1] C) [40, 50, 60, -2]		50, 60, -2]	D) Error: list index out of range	

## **Exercise: 2d Lists**

#### What will be printed?

```
data = [[10, 20, 30, -1], [40, 50, 60, -2], [70, 80, 90, -3]]
print(data[0][1])
```

A) 10

B) 20

C) 40

## **Exercise: 2d Lists**

#### What will be printed?

```
data = [[10, 20, 30, -1], [40, 50, 60, -2], [70, 80, 90, -3]]
print(data[3][4])
```

A) - I

B) -2

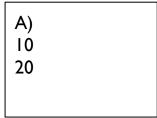
C) -3

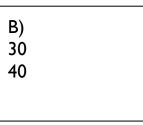
grades = [[90, 91, 92, 93, 100], [20, 0, 0, 100, 100], [100, 100, 100, 0, 0]]

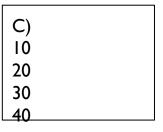
Indexes	0	1	2	3	4
0	90	91	92	93	100
1	20	0	0	100	100
2	100	100	100	0	0

# Exercise: Accessing 2d Lists using Nested For Loops

#### What will be printed?



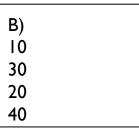


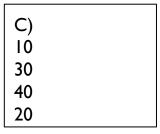


# Exercise: Accessing 2d Lists using Nested For Loops

#### What will be printed?

A)	
10	
20	
30	
40	





### Coding Challenge: Variable Updates in Nested For Loops

Write a function that given a day of the week (0 - 4), returns the weather in the three cities (Miami, Cleveland, San Diego) on that

day as a list.

```
>>> get a days weather(data, 0)
[23, 0, 9]
>>> get a days weather(data, 2)
[25, 1, 11]
>>> get a days weather(data, 4)
[26, -2, 11]
>>> get a days weather(data, 5)
'day 5 is invalid!'
>>> get a days weather(data, -1)
'day -1 is invalid!'
>>>
```

## **Tuples**

An easy way to group a small number of things together

Example: weight, age, and height of a person

maria = 
$$[141.5, 42.0, 5.5]$$
 jose =  $(180.5, 37.5, 6.1)$ 

Q: why not 3 independent variables?

Q: why not using a list?

## **Exercise: Tuples**

#### What will happen when we run this code below?

loc = (12.83, 11.93) a = loc[0] b = loc[1] b = 0 b = a

C) (0,0)

print(loc)

A) (12.83, 11.93) will be printed

B) (12.83, 0) will be printed

C) (0,0) will be printed

D) (12.83, 12.83) will be printed

E) Error: Tuples are immutable

## **Exercise: Tuples**

#### What will happen when we run this code below?

```
loc = (12.83, 11.93)
loc[1] = 13.61
print(loc)
```

A) (13.61, 11.93) will be printed

B) (12.83, 0) will be printed

C) (0,0) will be printed

D) (12.83, 13.61) will be printed

E) Error: Tuples are immutable

# **Exercise: Tuples**

#### What will happen when we run this code below?

```
loc = (12.83, 11.93)
(a, b) = loc
(b, a) = (a, b)
print(loc)
```

A) (11.93, 12.83) will be printed

B) (12.83, 11.93) will be printed

C) (11.93, 11.93) will be printed

D) Error: syntax error

E) Error: Tuples are immutable