# CSE 8A: Intro to Programming in Python

## Spring 2021

Lecture 4 - Define functions, conditionals

UC San Diego

# Status Check

How did the first week go?

A. It went very well
B. There is some glitch but overall good
C. It was quite bad for me
D. I can’t breathe now!

# Announcement

- PA1 due on Tuesday
- Use lab hours if you need help.
- Things we drop
  - 6 reading activities
  - 1 lab
- We need your stepik ID to get you reading grade
  - Complete the survey on edstem

# Topics for Today

- Defining your own functions
- Conditional statements

# What is a function

A function is a module of codes that can be used for a specific purpose

Why do we want to define a function?

A. It makes your code looks interesting
B. It can be reused many times and make your code easier to understand
C. It can help contain potential errors
D. More than 1 of the answers are correct
E. None of the answers is correct

# Terminology

```
def ftoc(fah):
        c = 5/9 * (fah - 32)
        return c

result = ftoc(75)
x = 60
anotherR = ftoc(x)
```

# Exercise: Defining Functions

Write a function that computes the cube of a given number.

Name of the function: cube

Input parameter(s): num

Return value: $num^3$

Test your function as shown below to verify if it works as expected

```
>>> cube(2)
8
```

```
>>> cube(3)
27
```

```
>>> cube(0)
0
```

# Functions

What will be printed when the following program is executed (run)?

```
def welcome(name):
    print('Hello, ' + name + '!')

msg = welcome('cse 8a')
print(msg)
```

A)
Hello, !
Hello, cse 8a

B)
Hello, cse 8a!
Hello, cse 8a!

C)
Hello, cse 8a!

D)
None of the given answers is correct

# Exercise

- Write a Python function to compute the area of a triangle
- The function should get the three sides of the triangle
- The function should return the area of the triangle
- You should use Heron's formula to calculate the area

$$area = \sqrt{p\,(p-a)\,(p-b)\,(p-c)}$$

where p = (a + b + c) /2

- https://www.mathopenref.com/heronsformula.html

# What is the correct function prototype

A. def triangle_area(a, b, c)
B. def triangle_area():
C. triangle_area():
D. def cirArea(a, b, c, area)

# Operator Precedence - Boolean Operators

| Order | Operator | Operator Name |
|---|---|---|
| 1 | not | Boolean NOT |
| 2 | and | Boolean AND |
| 3 | or | Boolean OR |

# Exercise: Booleans

What is the value of the expression below?

```
num = 12
(num != 12) and (num > 0) or (num % 2 == 1)
```

A) True
B) False
C) None
D) Error

# Exercise: Booleans

What is the value of the expression below?

```
num = 17
not num == 17 or num >= 17 and num // 2 == 8
```

A) True
B) False
C) None
D) Error

# Exercise: If/Else

What will be printed by the program below?

```
def mystery(n):
    if n < 0:
        return n * -1
    else:
        return n

print(mystery(-42))
```

A) -42
B) 42
C) The program will not print anything
D) The program will result in an error

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# Exercise: Nested Ifs

What will be printed?

```
num = 8
if num % 2 == 0:
    if num % 3 == 0:
        print('divisible by 2 and 3')
    else:
        print('divisible by 2 but not 3')
else:
    if num % 3 == 0:
        print('divisible by 3 but not 2')
    else:
        print('not divisible by 2 and 3')
```

A) divisible by 2 and 3
B) divisible by 2 but not 3
C) divisible by 3 but not 2
D) not divisible by 2 and 3

# Exercise: Nested Ifs

What will be printed?

```
num = 15
if num % 2 == 0:
    if num % 3 == 0:
        print('divisible by 2 and 3')
    else:
        print('divisible by 2 but not 3')
else:
    if num % 3 == 0:
        print('divisible by 3 but not 2')
    else:
        print('not divisible by 2 and 3')
```

A) divisible by 2 and 3
B) divisible by 2 but not 3
C) divisible by 3 but not 2
D) not divisible by 2 and 3

# What is true for block 1 and 2?

```
#block 1
if condition A:
   #statements A

elif condition B:
   #statements B

elif condition C:
   #statements C

else
   #statements D
```

```
#block 2
if condition A:
   #statements A

if condition B:
   #statements B

if condition C:
   #statements C

else:
   #statements D
```

A. they are basically the same code, no difference
B. for block 1, it is impossible that statements A and D are both executed
C. for block 2, it is impossible that statements A and D are both executed
D. More than one of the answers are correct
E. None of the answers is correct

# Exercise: Else If (elif)

Write a function that takes a number (float) as an input parameter and returns

0: if the number is zero

1: if the number is positive

-1: if the number is negative