

CS21: INTRODUCTION TO COMPUTER SCIENCE

Prof. Mathieson

Fall 2018

Swarthmore College

Outline Sept 24:

- Functions
 - add_mult.py
 - class_functions.py
 - factorial.py
 - lettercount.py

Notes

- **Lab 3** due **Saturday** night
- **Quiz 1** returned on **Wednesday**
- When we come back together as a class, please end side conversations – distracting for others around you

Recap if/elif/else,
and/or

movie.py

Assume that movie tickets have the following prices based on age:

- 0 – 12 years: \$8
- 13 – 64 years: \$12
- 65 and up: \$8

```
# 1) if/elif/else-----  
if age <= 12:  
    print("Your ticket price is", 8)  
elif age < 64:  
    print("Your ticket price is", 12)  
else:  
    print("Your ticket price is", 8)
```

movie.py

Assume that movie tickets have the following prices based on age:

- 0 – 12 years: \$8
- 13 – 64 years: \$12
- 65 and up: \$8

```
# 2) if/else + or-----  
if age <= 12 or age >= 65:  
    print("Your ticket price is", 8)  
else:  
    print("Your ticket price is", 12)
```

movie.py

Assume that movie tickets have the following prices based on age:

- 0 – 12 years: \$8
- 13 – 64 years: \$12
- 65 and up: \$8

```
# 3) if/else + and-----  
if age > 12 and age < 65:  
    print("Your ticket price is", 12)  
else:  
    print("Your ticket price is", 8)
```

movie.py

Assume that movie tickets have the following prices based on age:

- 0 – 12 years: \$8
- 13 – 64 years: \$12
- 65 and up: \$8

```
# 4) if/else-----  
if 12 < age < 65: # implicit "and"  
    print("Your ticket price is", 12)  
else:  
    print("Your ticket price is", 8)
```

Functions


```
def main():
```

```
    """
```

```
    In the main function, test our functions
```

```
    """
```

Calling a function, just like input(..), print(..), int(..)

```
    num1 = 3
```

```
    num2 = 5
```

```
    sum_result = add(num1, num2)
```

```
    mult_result = multiply(num1, num2)
```


```
    print(sum_result, mult_result)
```

```
main()
```

```
def add(x, y):  
    """  
    This function takes two numerical arguments and returns their sum.  
    """  
    s = x + y  
    return s
```

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def main():  
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    """  
    num1 = 3  
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    mult_result = multiply(num1, num2)  
    print(sum_result, mult_result)  
  
main()
```

Calling a function, just like input(..), print(..), int(..)



```
def add(x, y):  
    """  
    This function takes two numerical arguments and returns their sum.  
    """  
    s = x + y  
    return s  
  
def multiply(x, y):  
    """  
    This function takes two numerical arguments (x,y) and returns x*y  
    """  
    m = x * y  
    return m  
  
def main():  
    """  
    In the main function, test our functions  
    """  
  
    num1 = 3  
    num2 = 5  
    sum_result = add(num1, num2)  
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Keyword "def" defines a function

```
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Arguments or parameters (input)

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Description of function in triple quotes

Arguments or parameters (input)

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Indented: *body* of function

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← Description of function in triple quotes

← Arguments or parameters (input)

```
def multiply(x, y):  
    """  
    This function takes two numerical arguments (x,y) and returns x*y  
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    return m
```

← Indented: *body* of function

← Keyword “def” defines a function

```
def main(): ← main() is also a function (no arguments!)  
    """  
    In the main function, test our functions  
    """  
  
    num1 = 3  
    num2 = 5  
    sum_result = add(num1, num2)  
    mult_result = multiply(num1, num2)  
    print(sum_result, mult_result)
```

```
main()
```



```
def add(x, y):  
    """  
    This function takes two numerical arguments and returns their sum.  
    """  
    s = x + y  
    return s
```

← Description of function in triple quotes

← Arguments or parameters (input)

← Indented: *body* of function

```
def multiply(x, y):  
    """  
    This function takes two numerical arguments (x,y) and returns x*y  
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← Keyword “def” defines a function

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← Calling or invoking a function

```
main()
```

```
def add(x, y):  
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    This function takes two numerical arguments and returns their sum.  
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← Description of function in triple quotes

← Arguments or parameters (input)

← Indented: *body* of function

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def multiply(x, y):  
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```

← Calling or invoking a function

← Passing in arguments

```
main()
```

class_functions.py

Section 2

Yasmin
Eva
Abby
Angelina
Chris
Josh
Ricky
Chrisbet
Colin
Gwen
Julian
Luke
Dean
Rachel
Kat
Matt
Eudy
Juan
Karin
Juliette
Karinna
Ghazi
Jordan
Sam
Ella
Mirabai
Bilal
Christina
Iris
Tiffany
Tom
Owen
Larkin
Robert

Section 3

Faith
Santi
Sarah
Egor
Elizabeth
Carina
Jade
Ilana
Charles
Ollie
Maggie
Kyle
Maeve
Jason
Aron
Ellie
Charlie
Lauren
Bess
Francesco
Beluchi
Otis
Fefa
Grace
Camryn
Greta
Vivian
Helen
Avery
Theo
Tyler
Gene
Dominic
Jefferson

Problems to try now with a partner

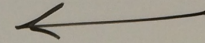
- [cs21/inclass/w04/factorial.py](#)
- [cs21/inclass/w04/lettercount.py](#)

If complete: return to [class_functions.py](#)

- [in_class\(name, section_lst\)](#)
- [random_student\(section_lst\)](#)

cs21/inclass/w04/factorial.py

$$n! = n \cdot (n-1) \cdot (n-2) \cdots 3 \cdot 2 \cdot 1$$



$$7! = 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$$



i	n! accumulate	multiply by
0	1	1
1	2	2
2	6	3
3	24	4
4	120	5
5	720	6
...	5040	7

(i+1)

