

OIM3640 - Problem Solving and Software Design

2022 Spring

Session 08 (2/10)



Today's Agenda

1. Welcome/News/Announcements
2. Review
3. Exercise Feedback
4. Lecture - **Iterations**
5. Q & A

Welcome/News/Announcements

1. Quiz 0 grading
2. No IN-PERSON/ONLINE Class Next Tuesday
3. Assignment 1 is posted on Canvas
 - i. Please accept it now
 - ii. Read instructions, including Code grading rubric
4. Office Hours
 - In-person: T/Th 6:15PM-7PM at Babson 326
 - Online: Webex by appointment
5. Questions?

What we have learned so far...

- Variables, Expressions, Statements
- **Types:** int, float, string, boolean, `None`, other data structures
- Functions
- `turtle` module
- Conditional Statements
 - `if...elif...else`
 - recursion (**not recommended** for beginners)

Quick Quiz

1. Do the **last two lines** below have the **same effect**?

```
def polygon(t, n, length):
    ...
polygon(leo, 7, 70)
polygon(leo, length=70, n=7)
```

2. If `age` is 21, what will be printed?

```
if age >= 6:
    print("teenager")
elif age >= 18:
    print("adult")
else:
    print("kid")
```

Python Tips

1. `__main__` check

```
if __name__ == '__main__':
# Running as the main program ...
# but does not execute if loaded with import ...
```

- Why: You should put this in all your Python scripts (YouTube)

2. To **swap** two variables:

- i. Use a temporary variable (in other programming languages)
- ii. A more **Pythonic** way: `x, y = y, x`

3. Use **comparison chain**:

```
if 18.5 <= bmi <= 30:
```

Practice

1. ★ [Codingbat](#) (OIM3640/codingbat)
2. [Python Challange](#)
3. More [learning resources](#)

Exercise Feedback

- Please check your OIM3640/**Issues** on GitHub.
 - **Reply** if we need to continue the conversation.
 - **Reply (with evidence) and Close** if you think it is fixed.
 - If you have any question regarding
 - Class **demo code**, create new issue in OIM3640/oim3640
 - Class **material**, create new issue in OIM3640/resources
- Recommendations:
 - File/folder names - use **lowercase** and **underscore**, i.e., *session04/type_demo.py*
 - Please add **docstrings** for the functions you create!
 - Please **TEST!!**
 - Please use separate files for different questions.

After (semi-)Finishing Exercises

- Check out my solutions in [OIM3640/oim3640](#)
- **Don't directly wipe out your current code.**
- **Make changes** based on it.
- Remember *More on How to Succeed in this Course?*

Questions from Comments/Issues

1. "how do i run just one function at a time?"
2. "I really don't know how to do it sry."
"I dont know how to draw that without a hint"
3. "I'm not sure why it is not moving 5 degrees and I can not figure out how to make the squares incrementally bigger."
4. "QUESTION: i created the function where a needs to be bigger than b, but not sure why the function still works even if b is bigger than a"

Issues #0

```
def check_fermat(a, b, c, n):
    if n > 2 and a**n + b**n == c**n:
        print("Holy smokes, Fermat was wrong!")
    else:
        print("No, that doesn't work.")

def check_number():
    a = int(input("Select value of a: "))
    ...
    return check_fermat(a, b, c, n)
```

- No need to return in second function

Issues #1

```
def get_bmi_category(BMI):
    if BMI < 18.5:
        print("Underweight")
    elif BMI < 24.9:
        print("Normal weight")
    elif BMI < 29.9:
        print("Overweight")
    elif BMI > 30:
        print("Obesity")
```

- What if `BMI` is `29.95` ?

Issues #2

```
def calculate_bmi (height, weight):
    """Calculate bmi through input of your height and weight."""
    height = float(input("Your height in meters: "))
    weight = float(input("Your weight in kilograms: "))
    print("Your bmi is: ", round(weight / (height * height), 2))
```

- `height` and `weight` are given!

Issues #3

```
def get_bmi_catagory(bmi):
    bmi = float(bmi)
    if bmi <= 18.5:
        print('Underweight')
    elif bmi in range[18.5,24.9]:
        print('Normal weight')
    elif bmi in range[25, 29.9]:
        print('Overweight')
    else:
        print('Obesity')
```

- Cannot use `range` this way.

Issues #4

```
...
if bmi <= 18.5:
    print("Underweight")
else:
    if bmi > 18.5 and bmi <= 24.9:
        print("Normal Weight")
    else:
        if bmi > 24.9 and bmi <= 29.9:
            print("Overweight")
        else:
            print("Obesity")
```

- Using too many layers is not recommended.

Issues #5

Why is the code below not a good design?

```
def calculate_bmi(weight, height):
    bmi = 703 * (weight/height**2)
    if bmi <= 18.5:
        return "You are underweight"
    elif bmi > 18.5 and bmi < 24.9:
        return "You are normal weight"
    elif bmi > 25 and bmi < 29.9:
        return "You are overweight"
    else:
        return "You are obese!"

def start_bmi(weight, height):
    response = calculate_bmi(weight, height)
    print(response)
```

- The second function is actually repeating the first function.
- Only need to return bmi value in first function.

Session 08

- Iterations

