HW 3 - Functions + Conditionals + Loops

Due February 18th, 2026 at 11:59pm

Overview

In this homework assignment, you'll practice using functions, conditionals, loops, and the `git pull` command to update a repository.

Note: If you need help importing functions or pulling from the `course_assignments` repository, please reference **Section 6: Bonus Content** in the **[Class 6]** slides on bCourses. Feel free to also look through **The GGG**.

1 Good Coding Habits

It's good practice to write your code in a way that's easy for other people to understand its purpose. There are several ways to do this:

- Add comments that explain the purpose of different parts of your code.
- Use descriptive variable names.
- Use clear and specific function names and arguments.

As you work through this homework, make sure your code is easy to read and understand. Here is an example of **how not to write a function** and **how to write a readable function**.

How NOT to Write a Function

```
def e(m):
    return m * (3e8)**2
```

How to Write a Readable Function

```
def energy(mass):
    # Calculates E = mc^2.
    speed_of_light = 3e8
    energy = mass * speed_of_light**2
    return energy
```

2 Create a Script

Inside your `yourname/` repository, create a folder named `homework3/`. Within that folder, create a file called `homework3.py`. In that folder, please complete the following problems.

3 Print Functions

3.1 Say Goodbye

In class, we created a **print function** called `say_hello`:

```
def say_hello(name):
    print("Hello,", name)
```

In `homework3.py`, create a **print function** named `say_goodbye` that prints a goodbye message.

3.2 Area of a Circle

Create a **print function** that prints the area of a circle based on a given radius.
Hint: The area of a circle is πr^2. You can approximate π as 3.14.

4 Return Functions

4.1 Subtract, Multiply and Divide

In class, we created a **return function** called `add`:

```
def add(a, b):
    return a + b
```

Now create **three return functions**:

- `subtract()`: subtracts one number from another
- `multiply()`: multiplies two numbers together
- `divide()`: divides one number by another

5 Conditionals

5.1 What Should I Wear?

You want to decide what to wear to the Python DeCal, based on the day's highest and lowest temperatures.

- Write a **return function** that takes a list of temperatures as input.
- Have the function return a **tuple** with the minimum and maximum values.

Hint: Example list: `readings = [15, 14, 17, 20, 23, 28, 20]`
Hint: Use Python's built-in `min()` and `max()` functions.
*Hint: A **tuple** of the `readings` list would look like: `(14, 28)`*

5.2 Check if it's the Weekend

In class, we created this **return function**:

```
def is_weekend(day):
    if day == "Saturday" or day == "Sunday":
        return "It's the weekend!"
    else:
        return "It's not the weekend."
```

Now change it up:

- Write a **return function** that takes an integer representing the day of the week.
- Return `True` if it's the weekend, and `False` otherwise.

Hint: Monday = 1, Tuesday = 2, ..., Sunday = 7

5.3 Fuel Efficiency Calculator

The Python DeCal is planning a trip to the Lick Observatory in San Jose, CA. Help determine which car is the most fuel-efficient.

- Write a **return function** that takes distance (in miles) and fuel used (in gallons) as input.
- Return the fuel efficiency (miles per gallon).

5.4 Secret Code

You've made a major discovery in astrophysics and need to encrypt your data.

- Write a **return function** that takes an integer as input.
- Move the last digit to the front of the number.
- Return the encrypted result.

Hint: Use modulus (`%`) and floor division (`\\`). Hint: Input `12345` would result in `51234`.

6 Loops

6.1 Oski Stole Your Power

Oh no! Oski hacked your computer and you can no longer use the `**` operator or the `pow()` built-in function.

- Write a **return function** that computes `x` raised to the power of `y`.

Hint: Use a `for` loop.

6.2 Min & Max with Loops!

Oh no! Oski hacked your computer again... now you have lost the ability to use `min()` and `max()` built-in functions.

6.2.1 For Loops

Write two **return functions** that each take a list of integers as input:

1. Use a `for` loop to find the **minimum** value.
2. Use a `for` loop to find the **maximum** value.

6.2.2 While Loops

Write two **return functions** that each take a list of integers as input:

1. Use a `while` loop to find the **minimum** value.
2. Use a `while` loop to find the **maximum** value.

6.3 Calculate the Sum

- Write a **return function** that takes an integer as input.
- Return the sum of its digits.

Hint: If the input is `2468`, the result should be `20`.

7 Running Your Script

Please complete all the parts above before continuing.

7.1 In Your VS Code Terminal:

You only have to show the outputs of **one** of your functions.

1. Open VS Code.
2. Open your `homework3.py` script.
3. Pick your favorite function from this problem set.
4. Include code at the bottom of your file that calls this function and prints the result.
   *Hint: If your favorite function is from **Oski Stole Your Power** and called `power()`, write:*

```
x = 2
y = 3
result = power(x, y)  # 2 raised to the power of 3

print(f"The result of Oski Stole Your Power (5.1) with x = {x}
and y = {y} is {result}.")
```

5. Run your **completed** script with the arrow button.
6. Take a screenshot of your **code** and the output on the VS Code **terminal**.
7. Name the screenshot: `hw3_vscode`
8. Save the screenshot in your `homework3/` folder.

7.2 On Your Terminal Application (Importing Functions):

Please show the output of **all** of your functions. You will now practice importing functions from a script.

1. Open the terminal (Mac) or Git Bash (Windows).
2. Navigate to your `homework3/` folder.
3. Open a Python session with the command line.
   Hint: Call: `python3`
4. At the top of your session, import your script by calling:

   ```
   import homework3 as h3
   ```

5. Run each of your functions individually using reasonable input values.
   Hint: To call the function `power()` from `homework3.py`, call:

   ```
   h3.power(x=2, y=3)
   ```

6. Take a screenshot of your **entire** script output.
7. Name the screenshot: `hw3_commandline`
8. Save the screenshot in your `homework3/` folder.

8 Pulling a GitHub Repository

In homework 2, you practiced cloning the `course_assignments` repository. Now you will practice pulling the latest changes with `git pull`.

- **clone** = download the repository for the first time
- **pull** = get the latest updates from GitHub

To get the latest `course_assignments` updates:

- Open the terminal.
- Navigate to `python_decal_sp26/course_assignments/`.
- Run:

  ```
  git pull origin main
  ```

- You should see a new folder called `homework3/`.
- Open it and find the file `average_vowels.py`.
- Copy **only** that file into your `homework3/` directory:

  ```
  cp average_vowels.py ../yourname/homework3/average_vowels.py
  ```

- Take a screenshot of pulling the repository and copying it into your `yourname/homework3/` directory.

- Take a screenshot of the code and the output, name it: `hw3_pull`.
- Save the screenshot inside your `homework3/` folder.
- Open the file you just copied in your `homework3/` directory.
- Read the instructions and complete the task.
- Run your code on VS Code.
- Take a screenshot of running the code.
- Name the screenshot: `hw3_average_vowels`.
- Save the screenshot inside your `homework3/` folder.

9 Submitting Your Homework

After completing the above assignments and running it in VS Code and on the command line, follow the steps below to save your work and submit to Gradescope.

Steps:

1. Save your work by running the following commands inside your `yourname` repository.

   ```
   git add .
   git commit -m "done with hw3"
   git push origin main
   ```

   (Note: You may use any commit message you prefer.)

2. Take a screenshot showing your terminal of calling all of the above steps with their outputs.
3. Name the screenshot: `hw3_changes`.
4. Place it inside your `homework3/` folder.

5. Ensure all screenshots are saved correctly and your code runs without errors. Your `homework3/` folder should now contain:

   ```
   homework3/
   |--- homework3.py
   |--- average_vowels.py
   |--- hw3_average_vowels.png
   |--- hw3_changes.png
   |--- hw3_commandline.png
   |--- hw3_pull,.png
   |--- hw3_vscode.png
   ```

6. Go to Gradescope and find the **Homework 3: Functions + Conditionals + Loops** assignment.
7. Select the option to upload a GitHub repository.
8. Submit your `yourname` repository.

Great job!