CMSC 201 Spring 2018
Homework 1 – Pseudocode to Code

Assignment: Homework 1 – Pseudocode to Code
Due Date: Friday, February 16th, 2018 by 8:59:59 PM
Value: 40 points

Collaboration: For Homework 1, collaboration is allowed. Make sure to consult the syllabus about the details of what is and is not allowed when collaborating. You may not work with any students who are not taking CMSC 201 this semester.

If you work with someone, remember to note their name, email address, and what you collaborated on by filling out the Collaboration Log.

You can find the Collaboration Log at http://tinyurl.com/collab201-Sp18.

Remember that all collaborators need to fill out the log each time; even if the help was only "one way" help.

Make sure that you have a **complete file header comment at the top of each file**, and that all of the information is correctly filled out.

```
# File:      FILENAME.py
# Author:    YOUR NAME
# Date:      THE DATE
# Section:   YOUR DISCUSSION SECTION NUMBER
# E-mail:    YOUR_EMAIL@umbc.edu
# Description:
#    DESCRIPTION OF WHAT THE PROGRAM DOES
```

Instructions

For each of the questions below, you are given a program, expressed in simple pseudocode. (This is similar to the in-class exercises we did during Lecture 2.) From this pseudocode, you must implement a working program in Python. For this exercise, you will only need to use concepts we have discussed in class such as variables, expressions, **`input()`**, casting to an integer or float, and **`print()`**.

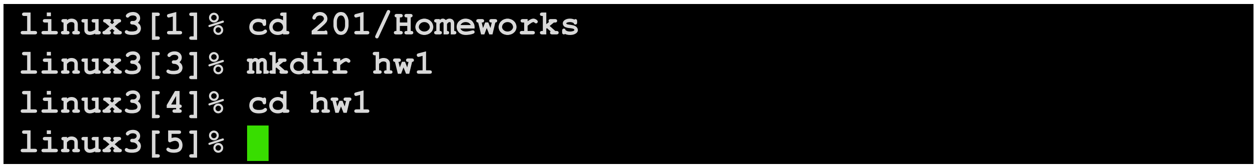
The pseudocode may combine multiple lines of code into one step, or they may split something that would take a single line of code into multiple pieces. Think carefully about what the overall goal of the program is before you begin coding.

At the end, your Homework 1 files must run without any errors.

Additional Instructions – Creating the hw1 Directory

During the semester, you'll want to keep your different Python programs organized, organizing them in appropriately named folders (also known as directories).

For Homework 1, you can store all four of the files you'll be creating in a single directory. First, navigate to the **`Homeworks`** directory inside the **`201`** directory (you can do this in a single "**`cd`**" command, as shown below). Next, create a directory to hold your Homework 1 files, and finally go into it.



```
linux3[1]% cd 201/Homeworks
linux3[3]% mkdir hw1
linux3[4]% cd hw1
linux3[5]%
```

From here, you can use **`emacs`** to start creating and writing your different Homework 1 Python programs.

You don't need to make a separate folder for each file. You should store all of the Homework 1 files in the same **`hw1`** folder.

Coding Standards

Prior to this assignment, you should read the Coding Standards, linked on the course website at the top of the “Assignments” page.

For now, you should pay special attention to the sections about:

- Naming Conventions
- Use of Whitespace
- Comments (specifically, File Header Comments)

We will not grade “harshly” on Coding Standards this early in the semester, but you should start forming good habits now. Make sure to pay attention to your TA’s feedback when you receive your Homework 1 grade back.

Additional Specifications

For this assignment, **you must use `main()`** as seen in your **`lab2.py`** file, and as discussed in class.

For this assignment, you do not need to worry about any “input validation.”

If the user enters a different type of data than what you asked for, your program may crash. This is acceptable.
If the user enters “bogus” data (for example: a negative value when asked for a positive number), this is acceptable. (Your program does not need to worry about correcting the value or fixing it in any way.)

For example, if your program asks the user to enter a whole number, it is acceptable if your program crashes if they enter something else like “dog” or “twenty” or “88.2” instead.

Here is what that error might look like:

```
Please enter a number: twenty
Traceback (most recent call last):
  File "test_file.py", line 10, in <module>
    num = int(input("Please enter a number: "))
ValueError: invalid literal for int() with base 10: 'twenty'
```

Questions

Each question is worth 4 points. Following the directions is worth 8 points.

Remember to enable Python 3 before running and testing your code:

```
    scl enable python33 bash
```

Question 1

Write your program for Question 1 in a file called **hw1_part1.py**.

This program, shown in pseudocode, prints out information about how many items you (the programmer) might have on your bed.

Translate this pseudocode into a Python program.

```
Set a number value for a variable called numPillows
Set a number value for a variable called numBlankets
Set a number value for a variable called numStuffedAnimals

Using those variables:
Print out how many pillows, blankets, and stuffed animals
    you have on your bed
Print out the total number of items on your bed
```

Here is some sample output, using sample values for *my* bed. (The number of pillows, blankets, and stuffed animals you have will probably be different.)

(Yours does not have to match this word for word, but it should be similar.)

```
bash-4.1$ python hw1_part1.py
I have 3 pillows on my bed
I have 2 blankets on my bed
I have 15 stuffed animals on my bed

I have a total of 20 items on my bed
```

Question 2

Write your program for Question 2 in a file called **`hw1_part2.py`**.

This program, shown in pseudocode, asks for information about how much the user's weekly allowance is, the cost to adopt from a shelter, and then calculates and prints out the number of weeks they'll need to save their allowance before being able to afford the adoption fee.

Translate this pseudocode into a Python program.

```
Ask the user how much their weekly allowance is
Ask the user how much the shelter's adoption fee is
Calculate the number of weeks they'll need to save up to
afford the adoption fee, and print it
```

For this program, the names of the variables are not given to you. You should choose meaningful variable names.

Here is some sample output, with the user input in **blue**.

(Yours does not have to match this word for word, but it should be similar. The calculated costs should be the exact same, given the same input.)

```
bash-4.1$ python hw1_part2.py
What is your weekly allowance? 20
What is the adoption fee at the shelter? 200
You'll need to save for 10.0 weeks

bash-4.1$ python hw1_part2.py
What is your weekly allowance? 10.75
What is the adoption fee at the shelter? 49.99
You'll need to save for 4.650232558139535 weeks

bash-4.1$ python hw1_part2.py
What is your weekly allowance? 15
What is the adoption fee at the shelter? 80
You'll need to save for 5.333333333333333 weeks
```

Question 3

Write your program for Question 3 in a file called **hw1_part3.py**.

This program, shown in pseudocode, asks the user for the name of their friend, and then prints out that the friend is a good friend.

Translate this pseudocode into a Python program.

```
Ask the user for the name of their friend and store it in
a variable called friendName
Print out that friendName is a good friend
```

Here is some sample output, with the user input in **blue**.

(Yours does not have to match this word for word, but it should be similar.)

```
bash-4.1$ python hw1_part3.py
What is the name of your friend? Michael
Michael is a good friend!

bash-4.1$ python hw1_part3.py
What is the name of your friend? Penny
Penny is a good friend!

bash-4.1$ python hw1_part3.py
What is the name of your friend? His Royal Highness,
Christopher Rupert
His Royal Highness, Christopher Rupert is a good
friend!
```

Question 4

Write your program for Question 4 in a file called **hw1_part4.py**.

This program, shown in pseudocode, asks the user for information about a meal they've eaten, and calculates and prints out the total cost of the meal.

Translate this pseudocode into a Python program.

```
Ask the user the cost of the drink
Ask the user the cost of the appetizer
Ask the user the cost of the main dish
Ask the user the cost of the dessert
Calculate and print the total cost of the meal
```

For this program, the names of the variables are not given to you. You should choose meaningful variable names.

Here is some sample output, with the user input in **blue**.

(Yours does not have to match this word for word, but it should be similar. The calculated costs should be the exact same, given the same input.)

```
bash-4.1$ python hw1_part4.py
What was the cost of the drink? 9.99
What was the cost of the appetizer? 15.99
What was the cost of the main dish? 38
What was the cost of the dessert? 10.12
The total cost of the meal will be 74.10000000000001

bash-4.1$ python hw1_part4.py
What was the cost of the drink? 6.50
What was the cost of the appetizer? 9
What was the cost of the main dish? 14.50
What was the cost of the dessert? 7.20
The total cost of the meal will be 37.2
```

Question 5

Write your program for Question 5 in a file called **hw1_part5.py**.

This program, shown in pseudocode, asks the user for information about a sports team, and prints out a summary of that information.

Translate this pseudocode into a Python program.

```
Ask the user for what sport the team plays, and store it
in a variable called sportInfo
Ask the user for the team’s name, and store it in a
variable called teamName
Ask the user for the number of players on the team, and
store it in a variable called numPlayers

Print out that teamName is a sportInfo team with
numPlayers players on the team
```

Here is some sample output, with the user input in **blue**.

(Yours does not have to match this word for word, but it should be similar.)

```
bash-4.1$ python hw1_part5.py
What sport does the team play? basketball
What is the name of the team? UMBC Retrievers
How many players are on the team? 13
UMBC Retrievers is a basketball team with 13 players
on the team

bash-4.1$ python hw1_part5.py
What sport does the team play? hockey
What is the name of the team? Vegas Golden Knights
How many players are on the team? 24
Vegas Golden Knights is a hockey team with 24 players
on the team
```

Question 6

Write your program for Question 6 in a file called **`hw1_part6.py`**.

This program, shown in pseudocode, asks the user for information about a bill they've received, and calculates and prints out how much they should pay in total.

Translate this pseudocode into a Python program.

```
Ask the user how much the bill was
Ask the user what the tax percentage is
Ask the user what percentage they want the tip to be
Calculate and print the total cost of the bill
```

For this program, the names of the variables are not given to you. You should choose meaningful variable names.

Here is some sample output, with the user input in **blue**.

(Yours does not have to match this word for word, but it should be similar. The calculated cost should be the exact same, given the same input.)

```
bash-4.1$ python hw1_part6.py
How much was the bill? 100
How much is tax in your area? 6
What percentage do you want to tip? 15
The total cost of the meal will be 121.0

bash-4.1$ python hw1_part6.py
How much was the bill? 26.88
How much is tax in your area? 4.5
What percentage do you want to tip? 16.7
The total cost of the meal will be 32.578559999999996
```

Question 7

Write your program for Question 7 in a file called **`hw1_part7.py`**.

This program, shown in pseudocode, asks the user for the rating a class has earned, and then gives advice on whether they should take the class or not.

Translate this pseudocode into a Python program.

```
Ask the user what the rating for a class was (from 0 to
5), and store it in a variable called classRating

If the rating is a 4 or higher, tell them to definitely
take the class
If the rating is at least a 2, but lower than a 4, tell
them to think twice about taking the class
If the rating is below a 2, tell them not to take the
class
```

Here is some sample output, with the user input in **blue**.

(Yours does not have to match this word for word, but it should be similar. The calculated ratings should be the exact same, given the same input.)

```
bash-4.1$ python hw1_part7.py
What is the class's rating? (from 0 to 5) 2
Think twice about taking this class.

bash-4.1$ python hw1_part7.py
What is the class's rating? (from 0 to 5) 4
Definitely take this class!

bash-4.1$ python hw1_part7.py
What is the class's rating? (from 0 to 5) 3.9
Think twice about taking this class.

bash-4.1$ python hw1_part7.py
What is the class's rating? (from 0 to 5) 0.88
Do not take this class.
```

Question 8

Write your program for Question 8 in a file called **hw1_part8.py**.

This program, shown in pseudocode, asks the user for information about how many items of food they want to buy at a fixed price, and calculates and prints out the total cost of the meal.

Translate this pseudocode into a Python program.

```
Use variables to set number values for the cost of pizza
slices, burgers, and cookies

Ask the user how many pizza slices, burgers, and cookies
they want to order
Calculate and print the total cost of the meal
```

For this program, the names of the variables are not given to you. You should choose meaningful variable names.

Here is some sample output, using sample cost values for *my* example restaurant. (The price of your pizza slices, hamburgers, and cookies should be different.) The user input is shown in **blue**.

(Yours does not have to match this word for word, but it should be similar. The calculated costs should be the exact same, given the same input and dish costs.)

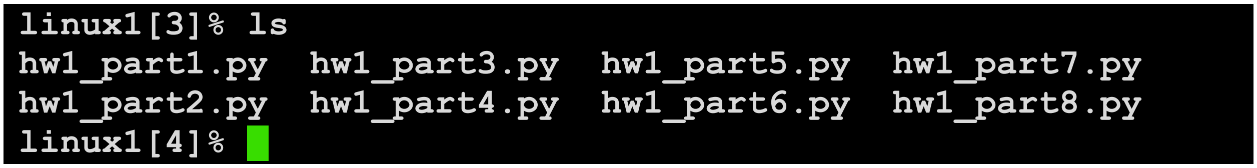
```
bash-4.1$ python hw1_part8.py
Pizza slices cost 3.5
How many pizza slices would you like to order? 3
Burgers cost 6.8
How many burgers would you like to order? 1
Cookies cost 0.99
How many cookies would you like to order? 5

The total cost of your meal will be 22.25
```

Submitting

NOTE: How to submit is covered in detail in Lab 1 and Homework 0. If you have not read those assignments yet, you should do so before completing this part of the homework.

Once your **hw1_part1.py**, **hw1_part2.py**, **hw1_part3.py**, **hw1_part4.py**, **hw1_part5.py**, **hw1_part6.py**, **hw1_part7.py**, and **hw1_part8.py** files are complete, it is time to turn them in with the **submit** command. (You may also turn in individual files as you complete them. To do so, only **submit** those files that are complete.)

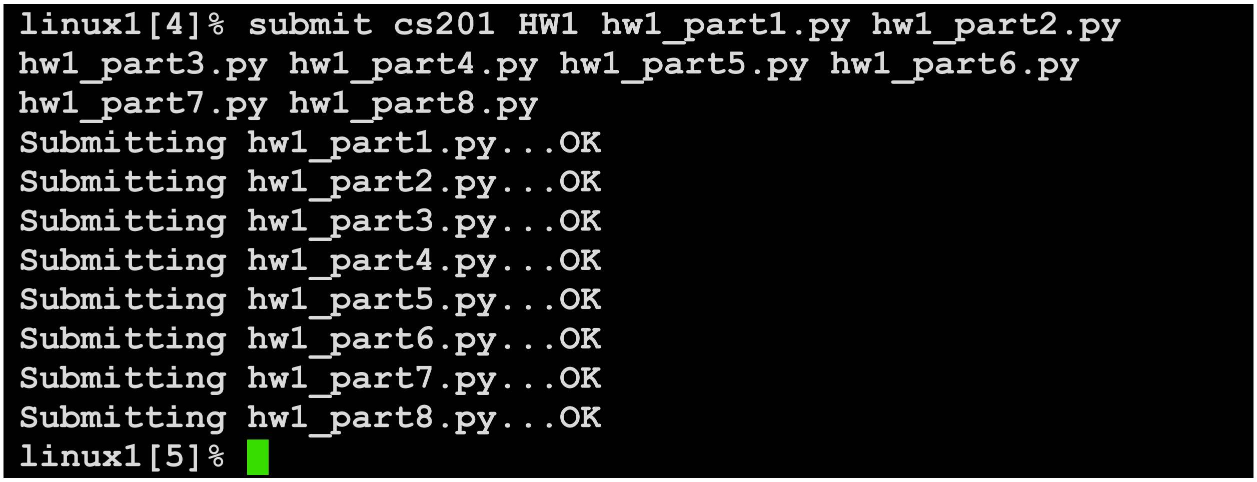
You must be logged into your account on GL, and you must be in the same directory as your Homework 1 Python files. To double-check you are in the the directory with the correct files, you can type **ls**.



```
linux1[3]% ls
hw1_part1.py  hw1_part3.py  hw1_part5.py  hw1_part7.py
hw1_part2.py  hw1_part4.py  hw1_part6.py  hw1_part8.py
linux1[4]% 
```

(continued on next page)

To submit your Homework 1 Python files, we use the **`submit`** command, where the class is **`cs201`**, and the assignment is **`HW1`**. Type in (all on one line) **`submit cs201 HW1 hw1_part1.py hw1_part2.py hw1_part3.py hw1_part4.py hw1_part5.py hw1_part6.py hw1_part7.py hw1_part8.py`** and press enter.



```
linux1[4]% submit cs201 HW1 hw1_part1.py hw1_part2.py
hw1_part3.py hw1_part4.py hw1_part5.py hw1_part6.py
hw1_part7.py hw1_part8.py
Submitting hw1_part1.py...OK
Submitting hw1_part2.py...OK
Submitting hw1_part3.py...OK
Submitting hw1_part4.py...OK
Submitting hw1_part5.py...OK
Submitting hw1_part6.py...OK
Submitting hw1_part7.py...OK
Submitting hw1_part8.py...OK
linux1[5]%
```

If you don’t get a confirmation like the one above, check that you have not made any typos or errors in the command.

You can check that your homework was submitted by following the directions in Homework 0. Double-check that you submitted your homework correctly, since **an empty file will result in a grade of zero for this assignment.**