

CS 1301

## Pair Homework 2 – Conversions/Complex Functions

**Due: Wednesday, May 29<sup>th</sup>, before 11:55 PM**

**Out of 100 points**

**Files to submit: 1. hw2.py**

You will be writing several functions, but they will all be saved in one file: hw2.py. Please save all of the functions in this one file or you will lose points. **This is a pair programming assignment!** You are expected to work with the person you have been paired with in class, and you are both responsible for submitting the exact same code to T-Square. Follow good pair-programming practices by working together at a single computer and switching the driver/navigator role frequently.

Your pair may collaborate with other students in this class. Collaboration means talking through problems, assisting with debugging, explaining a concept, etc. You should not exchange code or write code for other pairs. Collaboration at a reasonable level will not result in substantially similar code. For pair programming assignments, you and your partner should turn in identical assignments.

For Help:

- TA Helpdesk – Schedule posted on class website.
- Email TAs

Notes:

**Don't forget to include the required comments and collaboration statement (as outlined on the course syllabus).**

**Do not wait until the last minute** to do this assignment in case you run into problems.

If you find a significant error in the homework assignment, please let a TA know immediately.

### Part 1 – Conversions (45 pts)

#### Function name: area (15 pts)

Write a function called **area()** which takes in two numerical values, height and width. This function will use the given parameters and find the area. The area should be **printed** and not returned. The formula for area is:  $\text{area} = \text{height} * \text{width}$

Sample Output:

```
>>> area(10,5)
```

```
50
```

```
>>> area(30,1)
```

```
30
```

## Function name: volumeOfCylinder (15 pts)

Write a function called `volumeOfCylinder()` that takes in two parameters; radius and height. The formula for the volume of a cylinder is:  $V = \pi * r^2 * h$ . The first parameter will be radius and the second parameter will be height. Answer has to be rounded 3 decimal places. The function should print out “The volume is ” followed by the volume. **HINT: Use the built in pi value from the math library.**

Sample Output:

```
>>> volume(5,10)
The volume is 785.398
>>> volume(1,2)
The volume is 6.283
```

## Function name: seats (15 pts)

So, it's Friday and Rebecca Black needs to know how many seats there are for her to take. Since Rebecca does not know to code, she needs your help. Write a function called `seats()` which takes in two parameters cars and schoolbus. Each car has 3 seats for her to take and each schoolbus has 30 seats. The formula for this function is:  $\text{totalseats} = \text{cars} * 3 + \text{schoolbus} * 30$ . Make sure your order of operation is correct. Print the appropriate value with the message shown below.

Sample Output:

```
>>>seats(5,10)
Rebecca Black can take 315 seats.
>>>seats(0, 1)
Rebecca Black can take 30 seats.
```

## Part 2 – Complex Functions(50pts)

### Function Name: sandwichCalculator()

You are designing a function for the local Subway sandwich shop.

#### Parameters

Bread – An integer that will tell you how many breads there are

Tomatoes – An integer that will tell you how many tomatoes there are

Bacon – An integer that will tell you how many strips of bacon there are

Functionality: This function will calculate how many sandwiches can be made with the ingredients given and return the price of the total order. Each BLT(yes, this subway has run out of lettuce) contains 1 bread, 5 tomatoes and 3 strips of bacon and costs \$5. When one ingredient runs out, you cannot make any more sandwiches. For example, I have 3 breads, 9 strips of bacon but only 10 tomatoes. This means that I can only make 2 BLT sandwiches, because the tomatoes will run out. The cost of this will be  $(2 * 5)$  \$10. The number of sandwiches has to be a whole number(Integer) and the price has to be **RETURNED**. **\*\*HINT\*\*** Look at the python built-in `min` function, this may help you out.

Sample Output:

```
>>> answer = sandwichCalculator(10,10,10)
>>> print answer
10
>>> answer = sandwichCalculator(3,16,13)
>>> print answer
15
>>> answer = sandwichCalculator(5,25,12)
>>> print answer
20
>>> answer = sandwichCalculator(50,400,55)
>>> print answer
90
```

## **Function Name: waterBill()**

Parameters:

consumption – An integer that gives you the gallons of water consumed

pricePerGallon – A floating point number that gives you the price of water per gallon.

discount – A number which tells you how much discount is to be computed. A 0 means no discount.

Functionality: For this program, you will have three parameters and using these parameters you will determine the water bill. Due to a drought in the area, if the water consumption is over 500 gallons, the price you pay is doubled, but you are still eligible for the discount. Here are some sample test cases, make sure your function **RETURNS** and does not print.

```
>>> bill = waterBill(520,1.00,0)
>>> print bill
540.00
>>> bill = waterBill(520,1.00, .5)
>>> print bill
270.00
>>> bill = waterBill(100,1.00, .8)
>>> print bill
20.00
>>> bill = waterBill(500,10.00, .10)
>>> print bill
4500.00
```

## Grading Rubric

### Part 1 – Conversions – 50 points

Area –	15 Points
Function named correctly(area)	5 points
Performs correct conversion -	5 points
Prints the value -	5 points

volumeOfCylinder -	15 Points
Function named correctly(volumeOfCylinder)	5 Points
Performs correct conversion -	5 points
Print statement with values to 3 decimal places	5 points

Seats -	20 Points
Function named correctly(seats)	5 points
Performs correct math	5 points
Prints value with appropriate message	10points

### Part 2 – Complex Functions – 50 points

sandwichCalculaor	25 Points
Function named correctly(sandwichCalculator)	5 points
Performs correct calculations	10 points
Does not return a floating number	5 points
Returns the correct price	5 points

waterBill	25 Points
Function named correctly(waterBill)	5 points
Performs correct calculations(w/o discount)	10 points
Performs correct calculations(w/ discount)	5 points
Returns correct value	5 points