# **CIS 61 :: Lab 01 - Expressions and Functions**

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## Lab 1 - Expressions and Functions

**Instructions**: Use Sublime text editor to write your code and use Python shell to execute the below programs. Attach Snipping photos of **your source code** and **executions of the code in Python shell**.

### **Question 1**: **Twenty-Twenty-Four**

**Part 1:** Come up with the most creative expression that evaluates to 2024, using only numbers and the [+, \*, - ] operators. Use integers. Do not use round function.

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**Part 2:** Try to rewrite the same expression, this time entirely with call expressions. You can just use the terminal as well.   
 (using function calls: add, mul, sub, etc… You can use **from operators import add, mul, sub**)

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### **Question 2**: **Area**

**Part 1:** Write definitions for these functions (NO NEED TO CREATE DOCSTRINGS):   
sphereArea(radius) returns the surface area of a sphere having the given radius.   
sphere Volume (radius). Returns the volume of a sphere having the given radius.

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**Part 2:** Rewrite the above functions with lambda expressions and assign them to respective names. You can just use a Python shell and take the screenshot of the code.

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### Question 3: Rain or Shine

**Part 1:** Alfonso will only wear a jacket outside if it is below 60 degrees or it is raining.

Write a function that takes in the current temperature and a boolean value telling

if it is raining and it should return True if Alfonso will wear a jacket and False otherwise.

**Try solving this problem with a single line of code.**

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*Note that it should either return* ***True*** *or* ***False*** *based on a single condition, whose truthiness value will also be either True or False.*

**Part 2:** Rewrite the above function with a lambda expression. You can just use a Python shell and take a screenshot of the code.

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### **Question 4: Sum of the first N natural numbers**:

**Part 1:** Write a function sumNaturals (n) that returns the sum of the first n natural numbers. You can use this formula 1 + 2 + ... + n = n(n+1) / 2.

Make sure that the function returns an integer.

**Do not use a for loop or a while loop**.

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**Part 2:** Define a lambda expression that takes **n** and returns the sum of the first **n** natural numbers, using the above formula. You can just use a Python shell and take a screenshot of the code.

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### Question 5: You Define a Function

Part 1: Write a function that takes in one or two input parameters and returns an output. The function should return the output of a **one-line expression**. Write at least three test cases for your function in the docstring. Use the command line to test your function against the test cases. Take a screenshot of your code and the result of your test. Also, write the function in the below box as well.

Make sure your function has just one line of code

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Part 2: Write the same function as a lambda function.

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