

Assignment 3

Due on July 7th, 2023

Introduction to Programming with Python

Columbia University Pre-College Program—Summer Session I

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In this assignment, you will practice using variables, floats, integers, strings, lists, and dictionary methods in Python. You will write a program that performs some simple calculations and manipulations on different types of data. You will submit your program as a .py file on the course website. The file should be named `LastName_FirstName_Assignment3.py` where last name and first name are replaced with your last name and first name.

Problem 1

Write a function called `is_palindrome` that takes a string as an argument and returns `True` if the string is a palindrome (a word that is the same forward and backward) and `False` otherwise. For example, `is_palindrome("racecar")` should return `True` and `is_palindrome("python")` should return `False`. Use a loop and a conditional statement in your function.

Problem 2

Write a class called `Rectangle` that has two attributes: `length` and `width`. The class should have a constructor method that takes two arguments and assigns them to the attributes. The class should also have two methods: `area` and `perimeter`, that return the area and perimeter of the rectangle respectively. For example, if `r = Rectangle(3, 4)`, then `r.area()` should return 12 and `r.perimeter()` should return 14.

Problem 3

Write a function called `count_words` that takes a list of strings as an argument and returns a dictionary that maps each word in the list to the number of times it appears. For example, `count_words(["hello", "world", "hello", "python"])` should return `"hello": 2, "world": 1, "python": 1`. Use a loop and a dictionary in your function.