**PROGRAMMING ASSIGNMENT 5**

A colorful clock with a arrow

Description automatically generated with medium confidenceWrite your responses to parts 2 and 4 in the ‘Programming Assignment Documentation Template’ found in ManageBac. Make sure to include your name and the programming assignment number. Your code can be uploaded alongside the accompanying word document.

60 MIN

PART 1: PROBLEM STATEMENT

When creating programming languages one of the tried and true steps is making sure that your language knows how to balance parenthesis. When I say ‘balance’, what that means is that the statement is correct in the sense of each left parenthesis having a matching right parenthesis. Let’s look at an example:

(9 + (2 \* 3)) is a balanced parenthesis statement because for each left parenthesis there is a right parenthesis that follows.

(8 \* 7) + 3) is not a balanced parenthesis statement because there is an extra right parenthesis that does not correspond to a left parenthesis.

((4 \*\* 8) + 1 also is not balanced, because it has an extra left parenthesis.

)(4+ 3) is also not balanced because, even though there are two of each parenthesis, the leftmost right parenthesis cannot match to a left parenthesis.

You’ll be writing a program that will take an expression in as input, and return true or false, based on whether or not the program can correctly deduce if the parenthesis in a given statement are matched or not.

PART 2: BRAINSTORMING THE ALGORITHM

Before you jump into writing any code, jot down your thought process. Think about what procedures you might want to split your code into to accomplish this goal, or what abstract data types you might use and jot those down here.

You’ll be using some sort of abstract data type here that we’ve discussed in unit 5. Whichever one you decide to use, ensure that you only use procedures that are allowable in that ADT because Python doesn’t explicitly have it built in.

PART 3: WRITE THE PROGRAM

Write your code in a replit project, or PyCharm .py file, whichever is easiest.

Your code should loop to take input for parenthetical statements and print out to the console/terminal if that statement is matched or not.

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A screenshot of a computer code

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PART 4: REFLECTION

Answer the following questions in the ‘Programming Assignment Documentation Template’ found in ManageBac.

1. What were the challenges of using this abstract data type in your program despite it not being implemented in Python?
2. What Python methods did you use to emulate the functionalities of the ADT?
3. Did you have any difficulties in structuring the program to fit all the requirements?