CS 332 Programming Assignment P1: Largest Differences

TIME ESTIMATE: 1-2 hours

DELIVERABLES: Deliver one Racket file, named p1.rkt, by uploading to Canvas.

Only electronic documents submitted via Canvas are acceptable. Do not submit a hard copy of your assignment. Do not email your assignment to the course instructor or grader. Late assignments will be graded for half credit.

PROBLEM DESCRIPTION: Your code shall correctly perform the following three computations:

1. Given a single list of integers, l1, compute the largest positive difference between any two numbers in the list.
2. Given two lists of integers, l1 and l2, compute the largest positive difference, n – m, where n is an integer from L1 and m is an integer from l2.
3. Given two lists of integers, l1 and l2, compute the largest positive difference, m – n, where n is an integer from L1 and m is an integer from l2.

Note: The largest positive value is defined as the least negative value in cases where there is no difference greater than zero.

SOFTWARE REQUIREMENTS:

R1. The software shall be named p1.rkt.
R2. The lists shall be identified as ln in the software, where n is an integer value.
R3. The software shall contain a distinct named function for each of the three computations listed in the problem description.
R4. The software shall perform the tests cases in Table 1 with no user input.
R5. Given a single list of integers, the software shall compute the largest positive difference between any two numbers in the list.
R6. Given two lists of integers, l1 and l2, the software shall compute the largest positive difference, n – m, where n is an integer from l1 and m is an integer from l2.
R7. Given two lists of integers, l1 and l2, the software shall compute the largest positive difference, m – n, where n is an integer from L1 and m is an integer from l2.

TEST CASES: Test cases are provided in Table 1.

Table 1: Test Cases

Test Case ID	Input	Output		
		R5	R6	R7
1	l1 = (2 4 10 8 6)	8	na	na
2	l2 = (3 12 42 54), l3 = (60 40 -10 5)	na	64	57
3	l4 = (5 6), l5 = (0)	na	6	-5

RUBRIC: Grades are distributed per the grading rubric in Table 2..

Table 2: Grading Rubric

Deliverable	Points	Awarded
Program operates and produces output	5	
Correct test case results	10	
Correctness on other inputs	25	
Totals	40	