CS225 Homework 2
Package Parameters

DELIVERABLES: You will deliver three files as follows:

a. A MSWord, PDF, text, or similarly formatted file containing your answers to the questions in this assignment. Handwritten answers are not acceptable. File naming convention: Lastname_Firstname_HW01.<extension>.
b. The Manager.java file, without modification.
c. Your Box.java file, modified to meet the assignment requirements.

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. You may submit the deliverables as individual files or provide as a single zipped file, either is acceptable.

Important: Late assignments will not be graded.

PROBLEM DESCRIPTION: Package delivery companies typically charge for shipping a package based on parameters such as weight or package volume, or some other combination of features. In this assignment you will complete code to calculate package parameters and determine the largest of them. Packages are assumed to be six-sided, with 90 degree angles at all corners, so no odd shaped packages.

Packages are defined by their length (l), height (h), and width (w).

Package parameters of interest are volume, surface area, and edge length, where:

a. volume = $l \cdot h \cdot w$
b. surface area = $2 \cdot (l \cdot h + w \cdot h + l \cdot w)$
c. edge length = $4 \cdot (l + h + w)$

SOFTWARE REQUIREMENTS:

R1. The software shall correctly compute the package volume = $l \cdot h \cdot w$.
R2. The software shall compute the package surface area = $2 \cdot (l \cdot h + w \cdot h + l \cdot w)$.
R3. The software shall correctly compute the package edge length = $4 \cdot (l + h + w)$.
R4. The software shall calculate the largest of the volume, surface area, and edge length for any package.

TEST CASES: Test cases are given in the table below for requirements R1 through R4.

Test Cases	Input Parameters	Expected Output				Actual Output			
		R1	R2	R3	R4	R1	R2	R3	R4
1	length = height = width = 0.0	0.0	0.0	0.0	0.0				
2	length = 15.0, height = width = 10.0	1500.0	800.0	140.0	1500.0				
3	length = 10.0, height = width = 1.0	10.0	42.0	48.0	48.0				

Note: For this assignment, the test cases have been provided to you and are built into the software (Manager.java class). In future assignments you may be required to create your own requirements and test cases.

INSTRUCTIONS: In addition to these instructions you have been provided with two Java files: Manager.java and Box.java. Modify the methods in the Box.java file to correctly compute the package parameters defined above. Answer the questions given below.

QUESTIONS: Answer the following questions and turn in. See the DELIVERABLES section.

1. How many attributes and how many methods does the Manager.java file have?
2. How many attributes and how many methods does the Box.java file have?
3. How many Manager objects are created when the Manager file is executed?
4. How many Box objects are created when the Manager file is executed?
5. Can the methods in Box.java be executed without creating an object of the Box class?

RUBRIC: Per that grading rubric below.

Deliverable	Points	Awarded
Answers to questions (1 point each)	5	
Code compilation	4	
Correct code outputs using console input	5	
Correct Test Case Results (2 pts per test case)	6	
Totals	20	