## Lake Washington Institute of Technology

## CS143 Computer Science II Java

## Summer 2019

## Assignment 3

### Introduction

For this assignment you will complete programming challenges 4, 5, and 6. Each challenge leads from one to the next. When you are finished, submit a single working application that consists of the code that results from doing the three programming challenges, one after another.

### Chapter 10, Programming Challenge 4

Start by implementing Challenge 4 in chapter 10.

Design an ***Essay*** class that extends the ***GradedActivity*** class presented in chapter 10 (edition 3) of the Gaddis text for the course. The ***Essay*** class should determine the grade a student receives for an essay. The student’s essay score can be up to 100 and is determined in the following manner:

* Grammar: 30 points
* Spelling: 20 points
* Correct length: 20 points
* Content: 30 points

### Chapter 10, Programming Challenge 5

In a course, a teacher gives the following tests and assignments:

* A lab activity that is observed by the teacher and assigned a numeric score
* A pass/fail exam that has 10 questions. The minimum passing score is 70
* An essay that is assigned a numeric score
* A final exam that has 50 questions

Write a class named ***CourseGrades***. The class should have a ***GradedActivity*** array named grades as a field. The array should have four elements, one for each of the assignments previously described. The class should have the following methods:

***setLab*** – This method should accept a ***GradedActivity*** object as its argument. This object should already hold the student’s score for the lab activity. Element 0 of the ***grades*** field should reference this object.

***setPassFailExam*** – This method should accept a ***PassFailExam*** object as its argument. This object should already hold the student’s score for the pass/fail exam. Element 1 of the ***grades*** field should reference this object.

***setEssay*** – This method should accept as ***Essay*** object as its argument. See Programming Challenge 4 for the ***Essay*** class. This object should already hold the student’s score for the essay. Element 2 of the ***grades*** field should reference this object.

***setFinalExam*** – This method should accept a ***FinalExam*** object as its argument. This object should already hold the student’s score for the final. Exam. Element 3 of the ***grades*** field should reference this object.

***toString*** – This method should return a string that contains the numeric scores and grades for each element in the ***grades*** array.

### Chapter 10, Programming Challenge

Modify the ***CoursesGrades*** class created in Programming Challenge 5 so it implements the following interface:

Public interface Analyzable {

Double getAverage();

GradedActivity getHighest();

GradedActivity getLowest();

}

The ***getAverage*** method should return the average of the numeric scores stored in the ***grades*** array. The ***getHighest*** method should return a reference to the element of the ***grades*** array that has the highest numeric score. The ***getLowest*** method should return a reference to the element of the ***grades*** array that has the lowest numeric score.