CS 5004 Final Synthesis

Due: End of the semester. Exact dates TBA.

Description

For your midterm, I wanted you to prove to me an understanding of theory. For your final, I want to see an understanding of practice. Instead of a final, you'll be creating a lab manual of sorts to accompany this course.

I'd like you to be creative and show me your mastery of the course topic. Each assignment should be 100% original, should demonstrate you understand the topic, and provide a neat, complete, and accurate key (with lots of comments). Although you are welcome to look up other assignments for inspiration. Do not just go look up assignments in Java and restate them. This should be your own creation.

Each assignment should not be a repeat or a restatement of the lab you completed. I want to see you use the topic in a different way.

If you have any doubts, come see me during office hours and we'll take a look at your attempt.

Format:

Topic Introduction:

An introductory section describing the concept the lab is to address along with a brief explanation of that topic, but not as much as you would include in the mid-way synthesis.

Assignment Goals:

A bulleted list of learning objectives

Assignment Description:

A complete description of the assignment including a numbered list of steps, and any starting code you want to provide.

Key:

The assignment as you would like to have seen it completed.

Note: I'm not asking for a rubric, but feel free to include one.

Minimum Topics to cover:

1. Recursion in Practice
    a. This should involve an application actually using recursion in a meaningful way such as with the hierarchies and linked lists
    b. You can combine this with #3 or #4 if you'd like
    c. This is included because it felt weak on the midterm or on the lab assignment
2. Abstract Classes and Interfaces
    a. Make sure to use both appropriately and for their intended use
    b. Including a UML diagram here would be useful
    c. This should be more of an implementation example than what was on the midterm, and make sure you are using interfaces appropriately
3. Abstracted Linked Lists
    a. An implementation created by you used in a useful application
    b. I know the code will look similar, but use it in a different way
    c. I will not accept this if it doesn't use recursion in some way
4. Higher order functions map, filter, and fold
    a. Create an application that uses each of these
    b. You are welcome to combine this with 3 or 5
5. Hierarchical Data Representation
    a. Create and use a hierarchical data structure in a meaningful and useful way
    b. I know some of this code will look similar to what we did in class
6. MVC Design
    a. Create an example of MVC design as described in class
    b. Your application must do something useful
7. SOLID Principles
    a. Explain each letter of the SOLID Design Principle and create a code example
    b. I know this section is more theory, but I feel it is important
8. Any Design Pattern
    a. Choose another design pattern that we went over or one that you researched on your own
    b. Implement it and explain what it does and why it fits that pattern

Final Submission

Your final submission should also include a basic cover page(title, course, name, date, etc), an index for all of your chapters, and your content. File format needs to be pdf or html.

It needs to also include:

- A complete concept map
- A video walkthrough 10 - 15 minutes walking me through each key and explaining the concept
- A grading statement telling me what extensions you did and what grade you believe you deserve. Base this in facts and the rubric not feelings.

Tips:

- Have fun with it. Create a theme and try to stay on that theme.
- Don't wait until it is due. Create your content as we go through the semester.

Your submission does not have to look exactly like this, but here's an example to better explain my expectations:

https://docs.google.com/document/d/1QoZ57pVZX7jBfaMSzqqhnTTTxxYGwQhuP5-652tQfxo/edit?usp=sharing

Combining Sections

You do not have to have 8 assignments. You can combine topics, but make sure you have a clear concept map.

Concept Level(Basic, Intermediate, Advanced)	Concept	Where to find it	How it was demonstrated
...	...	...	...
...	...	...	...
...	...	...	...

Rubric

Concept 1 : Recursion in Practice	10 Points
Concept 2 : Abstract Classes and Interfaces	10 Points
Concept 3 : Abstracted Linked Lists	10 Points
Concept 4 : Higher order functions map, filter, and fold	10 Points
Concept 5 : Hierarchical Data Representation	10 Points
Concept 6 : MVC Design	10 Points
Concept 7 : SOLID Design Principles	10 Points
Concept 8 : Any design pattern	10 Points
Overall Quality	10 Points
Total Possible Points Out of 100	**90 Points**
Possible adjustments	
Extension	+10 Points
Bonus Points for creativity and going above and beyond	+10 Points
Work originality	-100 Points
Code quality	-50 Points
Video code walkthrough (if applicable)	-100 Points

All work must be 100% original and I reserve the right to ask you to explain any part of your submission. You will automatically receive 0 credit on the entire assignment if it is copied from an online source or another student. The only assistance for this project should be from your TA or your professor.