Correct III

Due Wednesday, December 9

This is an extra credit opportunity, available to everyone on both grading scales.

By doing a full and thorough exam correction, you can earn back up to 20% of the points you missed on Exam 3, added directly to your exam score. If you missed 20 points, for example, a correction of the highest quality earns up to 4 of them back.

This is *extra* credit, and you can only earn it through *excellent* work. Mediocre work will receive a zero, and generally acceptable work will receive few points. You are not simply submitting the correct steps for each problem, but doing the learning and writing outlined below.

The assignment

Start by reading carefully through the feedback on your exam. Then, for every problem on which you lost more than one point, write a short lesson on that problem, addressed to your future self when you review for the final. Each lesson has four parts.

1. **What the problem was asking.** Restate the problem in your own words. What was given, what had to be found, and what would count as a complete answer?

2. **Analysis of your original solution.** When you were working on it during the exam, what did you think about, or try? Where did it go wrong? If you were stuck at the beginning, or did not write much, what made it difficult to make progress?

3. **The mathematics the problem is about.** Describe the techniques, definitions, or theorems the problem depends on. Does it rest on using eigenvectors to build a basis of solutions, and choosing coefficients to match initial conditions? Computing e^{tA} one block at a time, or from the powers of a chain? Reading what each factor of the characteristic polynomial says about the motion, such as a rotation in an invariant plane? Finding mode shapes and frequencies from K, or working with the series for $C_K(t)$? Explain each idea in your own words, and say where it lives in the notes, so that future you can find it quickly when studying for the final.

4. **A full solution.** Now that you have reviewed the relevant ideas, write a *complete, fully annotated solution* in full sentences. Talk your reader through what you should be thinking about at each step. Write it as though you are truly trying to help your future self feel confident about this problem when reviewing the material months from now.

For a problem on which you lost exactly one point, a full lesson is not required. Instead, discuss your solution: say what went wrong, and correct it.

Your submission should be neatly handwritten or typed, in full paragraphs with complete sentences, and not a rough draft or an outline. **Make sure to include the statement of each problem**, so that the document is useful for self-study before the next exams.

Getting help

In general you *are* allowed to use AI tools to help you study and learn in this class. But just as you are not allowed to put in homework questions and ask for the answers, **you are not allowed to put in the exam questions and ask for answers.** You can talk with me, talk with friends, read the notes, and read things online, but you cannot ask an AI "what is this problem asking for," "critique my solution," or "give a full solution." Those are exactly the learning goals for *you* that this extra credit is supposed to reward.

It is fine to work with friends on thinking through and solving the problems. But then go *by yourself* and write *your own* solution, not a copy of theirs with more words added. It is okay to share ideas, but you have to do the writing and the thinking yourself if you want to grow.

Why do this?

If you do this after every exam, you will end the term with a complete set of solutions, written by you, to every exam problem you missed. That is a better study guide for the final than anything I could write for you, and a better record of what you learned in the course.