In Project 2, you will design a system that specifically supports the reading of college textbooks.

**Deadlines:**
Sunday, October 17, 2021, 10PM: HTA, scenarios, two designs (one must be either fully specified, or a complete paper prototype)  
Sunday, October 25, 2021, 10PM: Entire project

**Design** a textbook reading system that specifically supports five or so major subtasks of reading a textbook.

The goal of this project is to **design** a textbook reading system that supports well-established techniques for optimal reading comprehension of such texts. The ideal approaches to this design problem would start with the designer conducting a requirements analysis which would include (a) observing expert learners interacting with textbooks, perhaps even monitoring the experts' eye movements, and (b) interviewing these expert learners.

However, in this project, you will to some extent follow the adage that "a month in the laboratory can often save an hour in the library" and, rather than conducting a field study, you will use established guidance for how to read a textbook.

**Read** the guidance on these websites for how to read a textbook.

SQ4R is are discussed here:
https://www.cuesta.edu/student/resources/ssc/study_guides/reading_comp/305_read_text.html

One of the multiple reading techniques discussed here:
https://natsci.msu.edu/students/current-students/student-success-resources/academic-success/habits-to-develop-outside-of-class/study-strategies/reading-a-textbook-effectively/

The P2R technique is discussed in more detail here:
https://www.cornellcollege.edu/student-success-center/academic-support/study-tips/reading-textbooks.shtml

Active reading strategies discussed here:
https://learningcenter.unc.edu/tips-and-tools/reading-textbooks-effectively/
Read from front to back as discussed here:  
https://www.studyright.net/blog/4-steps-to-reading-a-textbook-quickly-and-effectively/

The ISR technique discussed here:  
https://willamette.edu/offices/lcenter/resources/study-strategies/reading2remember.html

**Generate Scenarios**

**Construct** an HTA based on one of the techniques described above. (The HTA should have 20 to 30 nodes.)

Write a **problem scenario** describing how a student could follow the textbook-reading technique using existing technology.

Write a **design scenario** describing how a student could follow the textbook-reading technique using existing technology. (Each scenario should have about 500 words.)

**Conduct Interaction and Information Design**

**Generate** at least three very different designs for this system. Each design should be accompanied by some sort of representation of how it works across time. You will design activities, information, and interaction.

At least one of these designs should be a **paper prototype** that has enough detail such that it could be used in a formative evaluation study to evaluate key design decisions in an interface that supports a realistic task.

At least one of these designs should be a **storyboard**.

At least one of the designs should be worked out in sufficient detail such that you could hand it to a human programmer who can program a user interface, and he or she would know exactly what to build in terms of user interaction (such as, if there are buttons to press, what is the title and functionality of each button). This design specification could take many different forms.

Each of the three alternative system designs does not need to be practical to implement. Try to think abstractly about the problems and solutions independent of the technology. Don't jump from the problem straight to talking about GUI components. The point of this exercise is to stop in between, and to identify activities, information, and interactions independent of the technological details.

**Information Design**
Determine the information that the user will need at each point in the interaction designs. Provide representations of how this information might be conveyed to the user. If there are visual components, make different hand-drawn sketches that show how the information might be presented in each alternative design. Each sketch should be clearly annotated and discussed in the body of the report.

**Do Some Analysis**

Conduct a **claims analysis** in which you hypothesize the pros (+) and cons (-) of each of the three designs. Follow Rosson and Carroll's example on p.100, and find at least one pro and one con for each feature. (about 500 words)

**Present** one or more of your design ideas in class. **Modify your design** based on feedback. Note that you can build on any ideas that any other student presents in class, but must provide attribution.

**Conduct a Formative User Observation Study**

Using your paper-based prototype, recruit three participants (not from this class) and have them test your paper prototype by using the "think aloud" protocol while they try to do a few specific tasks. Present the test users with a set of tasks and ask them to "use" your system to do the tasks. You will have to be organized and ready with the system's response after every user input. If it is a standard GUI, for example, you could write a little number next to each button, and have a set of numbered screenshots that you pull out of a folder and present to the user after each input.

Follow the **Ten Steps for Conducting a User Observation** (PDF, by Apple Computer) except that by necessity there will have to be substantial interaction as you play the role of the system. Most importantly, remind the participant that they can quit any time with no problem, and "we are testing the product, not you." When running the study, try to avoid discussions about the design of the system, but focus instead on how the participant would use the system to do the task.

Ideally, work with someone else in the class so the same users can test both of your systems. To compensate for any practice effects, have some participants use one system first, and the other participants use the other system first.

If working in pairs, one student should "run" the meeting and do most of the talking with the user. The other student might play the role of the computer, running the simulation, or silently observe and take notes about what works, and what does not work. You can both also write these things down immediately after the test, while your observations are fresh in your memory. You do not have to record the interactions, but you should take notes on confusion and "errors" that occurred.
Write a *Formative Evaluation Report* that documents what did and did not work in your design, comparing it to what did and did not work in the other design, if you like. Propose modifications to your design based on the report.

**Deliverables**
You should have a section for each of the following. The number of words listed for each section is meant as a rough guideline.

HTA (20-30 nodes)
Problem Scenario (500 words)
Design Scenario (500 words)

Three Information and Interaction Designs.
- All three must be complete.
- One must be fully specified, ready to implement.
- One must be a paper prototype usable for a formative usability evaluation.

Claims Analysis (300 words)
Feedback from colleagues (300 words). You must solicit this feedback.
Formative Evaluation Report (300 words)