CAIS 117: Intro to Programming with Python

Spring 2024

Final Project

Assignment milestones are DUE as indicated on the course schedule.

*This is a **group assignment**. Work with 2-3 classmates, and submit as a group on GitHub and Gradescope. **Individual assignments will not be accepted unless prior approval is obtained.***

Overview

For your final project you will build a software application. Your application must be interactive and include a graphical user interface. Other than that, it can be anything of interest to you as long as you meet the requirements below.

This project will be a large portion of your final grade, and is broken up into milestones, described below. Be sure to submit each milestone on time and to put your best effort into all pieces. Your final grade will be based on your grades for all milestones.

All milestones must be well formatted and readable. Text must be proofread, use good grammar, and communicate clearly. Code must be modular, well documented, and run reliably.

Milestone 1: Proposal – 20 points

For your project proposal you will identify your project group, your topic of interest, the major building blocks to your program, and potential roadblocks. Type up a document that answers the following questions. Your document should be 1 – 2 pages long and well formatted. ==**Submit as a group on Gradescope before class on the proposal due date**==. Your proposal will be reviewed in class so that you get quick feedback.

1. Group
   a. With whom do you plan to work? Groups must be 3 – 4 members (you must speak with me if you would like to work with a different size group).
   b. Talk about your schedules. Detail a plan for coordinating your work throughout the project.

2. Topic
    a. What type of application will you build? Why is this type of application important/interesting?
    b. Broadly speaking, what is the purpose of your application?
    c. If your application were to be released to the public, who would you expect to use your it?
3. Building Blocks
    a. Your program must use object-oriented programming. What classes do you expect to need to build your program?
    b. For each class, what will be the attributes and methods?
    c. What previous assignments or examples will you use as starting points for your application?
4. Roadblocks
    a. What roadblocks do you anticipate as you develop your application?
    b. Detail your plan for dealing with these roadblocks. How will you overcome them, or if you cannot, how will you modify your application?

Points will be awarded for answering each question above fully (each question is 2 points, 0 points will be awarded for missing or nonsensical answers, 1 point for partial answers, and 2 points for complete and correct answers).

Milestone 2: Prototype I – 20 points

Your first prototype will consist of three components: persona, paper prototype, and architecture diagram. Put together a document that addresses the following. Your document should be 1 – 2 pages long and well formatted. Submit as a group on Gradescope.

1. Persona
    a. Describe the hypothetical person for whom your application is designed. Be specific – name, age, job, other demands, etc..
    b. Discuss this person's relationship to technology.
    c. What specific needs does this person have that might affect how they interact with your application?
    d. Why will this person interact with your application? What will it help them do or provide to them that they cannot get elsewhere?
2. Paper Prototype
    a. Create a paper prototype or an electronic equivalent. You can take clear pictures, or physically hand in the prototype.

b. The paper prototype must clearly show what the graphical interface for your application will look like.

c. It must show examples of how the use can interact with the interface and how the interface will update / change in response to the user.

3. Architecture Diagram

a. What classes will your program include?

b. What are the methods and attributes of each class?

c. Pick three tasks that you program must accomplish. Explain in detail how your classes will interact to accomplish these tasks.

Points will be awarded for answering each question above fully (each question is 2 points, 0 points will be awarded for missing or nonsensical answers, 1 point for partial answers, and 2 points for complete and correct answers).

Milestone 3: Prototype II – 20 points

Your second prototype will focus on implementing your application. **The work you submit is not expected to be complete**; it is expected to show that you have made significant progress towards completing your application. Submit as a group on Gradescope. You submission should include a link to a repository housing your code.

1. In-progress code

a. Submit the code you have so far; it does not need to be perfect but should be readable and well documented.

b. Roughly half to two-thirds of your application should be implemented at this point.

2. Revised plans

a. Have you run into any roadblocks that significantly changed your application? Briefly explain what happened and how you adapted.

In-progress code will be awarded up to 15 points as follows:

	Missing / Not Complete (0)	Approaching (1-9)	Meets (10-14)	Exceeds (15)
Code	No code is included in the assignment, or the code included is unreadable.	Code is missing one or a few key elements such as documentation, attributing sources, modularity, or appropriate variable and function names. Or code includes these elements but significant improvement could be made.	Code includes documentation, attributes sources, is modular, and has appropriate variable and function names, but minor improvements in one or more of these areas could be made.	Code is well done. It includes appropriate documentation, attributes sources, is modular, and has appropriate variable and function names.

Revised plans will be awarded up to 5 points as follows:

	Missing / Not Complete (0)	Approaching (2)	Meets (4)	Exceeds (5)
Plans	No explanations included, or most are incorrect or missing.	Text demonstrates some conceptual understanding of programming and techniques, but multiple details are incorrect.	Text demonstrates a conceptual understanding of programming and techniques, but one or a few details are incorrect.	Text demonstrates a deep conceptual understanding programming and techniques. All explanations are accurate.

Milestone 4: Final Product and Presentation – 20 points

Your final milestone includes all the final deliverables for your project. Your submissions should we well formatted, proofread, and clear. <mark>Submit on as a group Gradescope before class on the day presentations begin.</mark> **No late submissions will be accepted. There will be no exceptions to this rule.** You will submit a final report, that includes text and a link to a repository containing code, and give a presentation to the class.

1. Your **final report** should include:
   a. A written report and code
   b. The written report should:
      i. Be well formatted.
      ii. Be proofread.

      iii.   Include an introduction to your project with an overview of the application you built and an explanation of why the application is interesting and important.

      iv.   Include an overview of who you expect to use your application. Why will people use it? What will it do for them that will make their lives easier or improved in some way?

      v.   Walk the reader through your development process. How did the application change from your initial conception to your final product?

      vi.   Include a conclusion. If you were to build on the application, what would you do? How could you further improve it?

      vii.   Include citations for any sources referenced.

  c. Code should:

      i.   Be well documented.

      ii.   Run reliably without errors.

      iii.   Be modular and use the programming techniques you learned throughout the semester.

      iv.   Include citations for any sources referenced.

2. Your **presentation** should:

  a. **Not** show code. Do not walk the audience through your code.

  b. An introduction to your project with an overview of the application you built and an explanation of why the application is interesting and important.

  c. An overview of who you expect to use your application. Why will people use it? What will it do for them that will make their lives easier or improved in some way?

  d. An overview of your development process. How did you application change from your original idea?

  e. A demonstration of your application. Show us how a user would interact with it and what it would do for them.

  f. A conclusion. If you were to build on the application, what would you do? How could you further improve it?

  g. Contributions from all group members (each person must talk).

  h. Time for Q&A. [In total, your presentation should be ~10 minutes.]

Points will be awarded for addressing each bullet point above fully (each question is 1 point, 0 points will be awarded for missing or nonsensical work, 1 point for complete and correct work).

Reflection

Your reflection is an individual portion of the project that you will submit on Gradescope individually. The purpose is to reflect on your own work, and how your group worked together.

Write a few short paragraphs that address these points:

1. Your specific contributions to the project.
2. Your teammates' specific contributions to the project.
3. Whether you navigated any conflict or discrepancy in workloads with your teammates.
4. How you navigated those conflicts or redistributed work.

You will not receive points for your reflection; however answers may be used to adjust individual's project grades if the distribution of work was not even.