Advanced Software Engineering

CSE870, Spring 2025

Homework 5 and MiniProject Preliminaries Due: March 10, 2025

Work with another team on this assignment (you will be assigned a team). You will have some choices to make based on feedback from previous homework. 1) Choose one team's set of system requirements and use case diagram, adding at least 1 use case (and corresponding requirements) from the other team's artifacts; OR 2) Integrate the system requirements and develop the corresponding use case diagram. In both cases, adjust your list of requirements and use case descriptions to ensure consistency across the artifacts.

As part of completing a software requirements specification (SRS), this assignment will have you use the class diagram notation to create a domain model for **the Pedestrian Backup Assist System (PBAS)**. Note that your domain model must cover all the goals, actors, and interactions that you identified in your use case diagram in the previous homework assignment, as well as the following additional concerns.

In addition to the requirements identified earlier, below are two new items to be addressed in your project documentation:

1. (*New Functional Requirement*): Based on the literature review (see webpage for new resources), add one new functional requirement to the current system that you are modeling. (Explain why you added this particular requirement.) Extend the use case diagram accordingly. And be sure to add this new capability in the domain model.

2. (*Uncertainty*) Identify at least 3 sources of uncertainty affecting your system. For each of these sources, address the following points.

- ***a.*** Describe the potential impact of uncertainty.
- ***b.*** How do you detect it? (indicate in your domain model which component(s) are responsible for monitoring for this condition)
- ***c.*** What do you do to mitigate the uncertainty? (indicate in your domain model which component(s) are responsible for mitigating this condition)

Assignment Requirements:

1. Complete a draft of the Software Requirements Specification (SRS) template, where all sections should be completed, except for those referring to security and state diagrams.

2. Attach a copy of the original use-case diagram and requirements list upon which you created your class diagram. (Include as much documentation from your use case description to understand the class diagram entities.)

3. Include a copy of the revised enumerated requirements and use case diagram (including the corresponding descriptions). You should have accompanying text indicating the changes that you made to the requirements list and use case diagram, including the rationale for the changes (e.g., refinement, correction, new requirement, etc.)

4. Use Visual Paradigm to create a domain model for **PBAS** based on the use case diagram and corresponding requirements.

5. Create a data dictionary entry for each class. Use the below data dictionary template.

6. Be sure to include prose description for all of your diagram elements, in addition to the information provided in the data dictionary.

7. State any assumptions that you are making that were not explicitly stated in the requirements and/or the use case diagram.

8. Identify areas for improvement for the use case diagram and/or requirements. Explain why these improvements would be useful/necessary.

Class data dictionary entry template:

Class		
Name	***Description (responsibilities)***	
	Export control (public: yes/no)	
		Associations:

	Relationships	Aggregations/Compositions:
		Generalization:
	List of attributes and their primitive types	
	List of operations (include parameters and results)	

Use Case Template : (for your convenience, the template is provided again).

Use Case:	***Name***
Actors:	***Name of actors interacting with current use case***
Description:	***Description of the goals, objective, services provided by use case***
Type:	***Primary (essential) or secondary***
Includes:	***Name of use cases that the current use case includes (common goal shared by 2 or more use cases)***
Extends:	***Name of use cases that the current use case extends (the name of the normal scenario use case that the current use case extends)***
Cross-refs:	***Number of requirement(s) that the current use case addresses***
Use cases:	***Enumerate use cases that are dependent upon the current one.***