OO Analysis and Design Lab Week 2

Solution

Q1

. Additional cycles of system development often extend the scope of the system by identifying additional events to which users wish the system to respond. This exercise extends the scope of the student registration system.

The Records Office still maintains students’ grades and transcripts manually. The Registrar wishes to extend the current automated system to be able to record students’ grades at the end of each term and produce grade reports for both students and instructors.

In your conversation with the Registrar, you have learned that within one week after the examination period instructors submit a grade sheet containing the grades students have earned in each class. The Records Office keeps a permanent record of the grades and produces a student grade report, which is mailed to each student, and an instructor’s grade report, which is distributed to each faculty member.

1. Identify the additional events to which the automated system must now respond.

**The additional events are**

*“Professor submits grades” and*

*“Time to produce student grade report.”*

1. Modify the event table to incorporate these events

Imagine that each system input arrives individually. Do not assume that its data structure contains iterations unless you know that such a structure is essential.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Event Description** | **System Input** | **Actor Providing Input** | **System Output** | **Actor Receiving Output** |
|  |  |  |  |  |  |
|  | Professor submits grades | Grade Sheet | Instructor | Instructor’s Grade Report | Instructor |
|  | Time to produce student   grade report |  |  | Student Grade Report | Student |

1. List other events which might be included in a university registration system of extended scope. If you wish, you may add them to the event table.

Q1 **Possible additional events are:**

“*Time to produce student fee bill”*

*“Student pays fee bill”*

*“Department adds to course to catalog”*

Q1 (v)Prepare expanded essential use case narratives for the additional event “ Instructor

submits grades.

Use case: **Submit Grades**

Actors: Professor

Purpose: Record the grades for each student in a section for the current term.

Overview: At the end of the current term the Professor submits a grade for each   
 Student in a section. The system records the grades. On completion,   
 the system provides the Professor with a list of the grades recorded for   
 the section.

Type: Essential

Preconditions: Section must exist.  
 Professor is known by the system.  
 Student is known by the system.  
 Each Student is enrolled in the section.

Post conditions: A grade was recorded for each Student.

**Flow of Events**

|  |  |
| --- | --- |
| **Actor Action** | **System Response** |
| 1. This use case begins when a Professor submits a grade sheet for a Section. |  |
| 2. The Professor provides the professor’s identifier, the department code, course number, and section number for the section. For each Student in the Section, the Professor provides the student’s identifier and the student’s grade. | 3. Records each student’s grade. |
| 4. On completion of entry of the grades, the Professor indicates that the entry of grades is complete. | 5. Produces professor’s grade  report. |
| 6. The Professor receives the instructor’s grade report. |  |

**Alternative Flow of Events**

Line 3: Invalid department code, course number entered. Indicate error. Return to Step 2.   
 Invalid section number entered. Indicate error. Return to Step 2.  
 Invalid professor identifier entered. Indicate error. Return to Step 2.  
 Invalid student identifier entered. Indicate error. Return to Step 2.  
 Student not enrolled in the section. Indicate error. Return to Step 2.

Prepare expanded essential use case narratives for the additional event “ Instructor

Note \*\*\*No expanded essential use case narrative is shown here for Produce Student Grade Report because there is no input from an actor

Q2 Modify the use case narrative for Register for Classes to require that the system check prerequisites before adding a student to a class.

Step 3 is modified as follows

***3. Adds the student to the section if there are seats available and the student has the prerequisites.***

Q3 Draw a system sequence diagram for the typical flow of events for the use case Submit Department Class Schedule.



Q4 Draw a system sequence diagram for the use case **Check out library Book** .

Note: According to this use case narrative, only one book can be checked out per transaction. This is unrealistic and should be corrected in a subsequent iteration of the use case analysis.

