Calculating and Managing Student GPA

**Name: Mohammed Abdel Moneim Badran**

Scope: Develop and maintain a project that allows calculating and managing Student GPA. The system should have a user login and transaction tracking module for the auditing purpose. System must be able to generate reports (Here create to generate grade card, Student Details, and Course VS Student report) for all the levels of users.

Scope Details: System users will be assigned different privileges and functionalities according to their user type. The system consists of server modules. Each Module offer a number of functionalities as illustrated below.

1. **Authentication and Authorization Module**
   1. **Authentication**: verifies who you are the user trying to log into the system; and grants him/her access if he was in the database records.
   2. **Authorization**: verifies what an authentic user is authorized to do. For example, a faculty will be able to perform a set of functionalities that is different from the functionalities that a student can do.
2. **Search Module**
   1. **For Student:** searches for a student by Student ID and returns all details about him/her.
   2. **For Course:** searches for a course by Course ID and returns all details about that course (i.e. all sections offered for that course).
   3. **For Section:** searches for a section by Section ID and returns all details about that section (i.e. all students taking that section).
   4. **For Grade Transactions:** searches for all transactions done to add grades for students of a certain Section ID and returns date and time - when each grade was added.
3. **User Management Module**
   1. **Create:** a new user
   2. **Read:** an existing user data
   3. **Update:** an existing user data
   4. **Delete:** an existing user
4. **Course Management Module**
   1. **Create:** a new course
   2. **Read:** an existing course data
   3. **Update:** an existing course data
   4. **Delete:** an existing course
   5. **Evaluate/Add Grades:** assign grades to the students per section
5. **Feedback Module**
   1. **Publish Grade Report:** print all grades for a given section
   2. **Print Grade Card:** print grades for a certain student
6. **Transaction Tracking Module**
   1. **Tracks date and time:** of Grade Addition

Technologies

1. Microsoft SQL Server 2008
2. Html / DHTML / AJAX
3. Java Script
4. Java
5. JSF
6. EJB or JPA
7. Glassfish or JBOSS (will go with Glassfish and try using
8. GIT
9. JUnit

Design Patterns

* **Singleton:** for DB connection
* **Observer:** Tracking Module
* **Strategy Pattern:** User Role Module (benefit: latter on if we decided to add a new user type - say employee - we do not have to change the db schema).

Assumptions

We assume that the following functionality is required by the customer:

* CRUD user is required to implement
* CRUD course is required to implement
* Administrating User Rules
* Session/Security Management
* Student Evaluation OR Claim about the grade
* Communication Layer between roles (internal email system)
* Bulk Email Module or Web Service whenever the grades are published the grades are sent to him
* System failure Notification for Administrator
* Reporting format (PDF, Word, etc ...)
* Course and semester will be like (software2023)

Concerns

* **Production Server:** Customer requires a production server that we may not be able to provide.
* **Backup System:** Customer requires a backup server that we may not be able to provide.
* **Development Server:** Customer requires a development server that we may not be able to provide.
* **GPA Equation:** GPA Equation has to be provided maximum by tomorrow.

Matrix

| **Major Milestone** | | | **Develooper1** | **Develooper2** | **Develooper3** | **Develooper4** | **Develooper5** | **Project Manager** | **Sponsoring Authority** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Authentication and Authorization Module | | | E |  |  |  |  | I/C | A |
| 2. Search Module | | | C | E | C | C | C | I/C | A |
| 3.User Management Module | | |  |  | E |  |  | I/C | A |
| 4. Course Management Module | | |  |  |  | E |  | I/C | A |
| 5.Feedback Module | | |  |  |  |  | E | I/C | A |
| 6.Transaction Tracking Module | | |  |  |  |  |  | E/I/C | A |
|  |  | **Legend** E = responsible for execution (may be shared)  A = final approval for authority  C = must be consulted  I = must be informed | | | | | | | | |