School Management System

Student Mark Registration

Design Document

# Purpose

The document illustrates the design of student mark registration module.

# For the Associates:

Associates should refer the following documents to understand the screen design and the high level design.

* CaseStudyScreenDesign.doc – Ilustrates the screen design the associates to follow for developing the application.
* CaseStudyMasterDesign.docx – Ilustrates the class hierarchy, flow sequence , packaging details and exception handling mechanism for developing the application.

# Database Design

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table Name | Column Name | Column Discription | Data Type | Data Size | Primary Key |
| STUDENT\_MARK\_PRIMARY | STUDENT ID | Column is used for storing student id | varchar2 | 5 | Yes |
|  | ENGLISH\_MARK | Column is used for storing the english subject mark of the student | Number | 3 |  |
|  | HINDI\_MARK | Column is used for storing the hindi subject mark of the student | Number | 3 |  |
|  | SCIENCE\_MARK | Column is used for storing the science subject mark of the student | Number | 3 |  |
|  | MATHS\_MARK | Column is used for storing the maths subject mark of the student | Number | 3 |  |
|  | TOTAL\_MARK | Column is used for storing the total mark of the student | Number | 3 |  |
|  | AVERAGE\_MARK | Column is used for storing the average mark of the student | Number | 5,2 |  |
|  | GRADE | Column is used for storing the student grade | Char  Values can be ‘A’ or ‘B’ or ‘C’ or ‘F’ |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table Name | Column Name | Column Discription | Data Type | Data Size | Primary Key |
| STUDENT\_MARK\_SECONDARY | STUDENT ID | Column is used for storing student id | varchar2 | 5 | Yes |
|  | ENGLISH\_MARK | Column is used for storing the english subject mark of the student | Number | 3 |  |
|  | HINDI\_MARK | Column is used for storing the hindi subject mark of the student | Number | 3 |  |
|  | SCIENCE\_MARK | Column is used for storing the science subject mark of the student | Number | 3 |  |
|  | SOCIAL\_MARK | Column is used for storing the social subject mark of the student | Number | 3 |  |
|  | MATHS\_MARK | Column is used for storing the maths subject mark of the student | Number | 3 |  |
|  | TOTAL\_MARK | Column is used for storing the total mark of the student | Number | 3 |  |
|  | AVERAGE\_MARK | Column is used for storing the average mark of the student | Number | 5,2 |  |
|  | GRADE | Column is used for storing the student grade | Char  Values can be ‘A’ or ‘B’ or ‘C’ or ‘F’ |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table Name | Column Name | Column Discription | Data Type | Data Size | Primary Key |
| STUDENT\_MARK\_HIGHER | STUDENT ID | Column is used for storing student id | varchar2 | 5 | Yes |
|  | ENGLISH\_MARK | Column is used for storing the english subject mark of the student | Number | 3 |  |
|  | TAMIL\_MARK | Column is used for storing the tamil subject mark of the student | Number | 3 |  |
|  | PHYSICS\_MARK | Column is used for storing the physics subject mark of the student | Number | 3 |  |
|  | CHEMISTRY\_MARK | Column is used for storing the chemistry subject mark of the student | Number | 3 |  |
|  | COMPUTER\_MARK | Column is used for storing the computer subject mark of the student | Number | 3 |  |
|  | MATHS\_MARK | Column is used for storing the maths subject mark of the student | Number | 3 |  |
|  | TOTAL\_MARK | Column is used for storing the total mark of the student | Number | 3 |  |
|  | AVERAGE\_MARK | Column is used for storing the average mark of the student | Number | 5,2 |  |
|  | GRADE | Column is used for storing the student grade | Char  Values can be ‘A’ or ‘B’ or ‘C’ or ‘F’ |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table Name | Column Name | Column Discription | Data Type | Data Size | Primary Key | Foreign key |
| SUBJECT\_INFO | CATEGORY | Column is used for storing the student standard category | Char  Values can be ‘P’ or ‘S’ or ‘H’ |  | Yes |  |
|  | SUBJECT\_NAME | Column is used for storing the subject name | varchar2 | 25 |  |  |

# Required Objects, Services, and Libraries

### Value Objects:

|  |  |
| --- | --- |
| **Value Object Name** | **Value Object Description** |
| MarkVO | This VO is used for transferring the student mark details from presentation to the back end. |

# Technical Specifications



## Student selection screen: This screen is used by admin to select the student details from the system.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Data Element** | **Control type** | **Default Values** | **Editable Field** | **Restrictions** | **Mandatory/**  **Non Mandatory** | **Data Type** | **Data Size** |
| Student ID | Dropdown box | No | No | Should be populated from the student\_info table | Mandatory |  |  |
| Student Name | TextBox | No | No | Should be populated from the student\_info table based on the selection of student id | Mandatory |  |  |
| StudentStandard | TextBox | No | No | Should be populated from the student\_info table based on the selection of student id | Mandatory |  |  |
| StandardCategory | Textbox | No | No | Only Characters | Mandatory |  |  |
| Add | Submit Button | No | No | By Clicking the button, mark entry page will be displayedwith the subject names based on the standard category along with the selected student id. | Mandatory |  |  |

## Mark Entry screen: This screen is used by admin to enter the student mark details into the system.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Data Element** | **Control type** | **Default Values** | **Editable Field** | **Restrictions** | **Mandatory/**  **Non Mandatory** | **Data Type** | **Data Size** |
| Student Id | Textbox | No | No | Should be populated from the student\_info table | Mandatory |  |  |
| SubjectName | Textbox | No | Yes | Subject names will be get populated from the database based on the standard category. | Mandatory | Number | 3 |
| Save | Submit Button | No | No | By Clicking the button, all the field contents will be validated and stores all the details into the system | Mandatory |  |  |
| Reset | Button | No | No | By Clicking the button, the contents in all the fields will be cleared. | Mandatory |  |  |

On successful entry the following message should be displayed **“Student Marks updated Successfully”**

## Application Components Specification:

Refer to the sequence and class diagram in the master design document for details on the components hierarchy, how they structured and integrated.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Component Name** | **Method Name** | **Method input** | **Method Output** | **Description** | **Algorithm** |
| SchoolMarkDelegate | studentMarkEntry | MarkVO | boolean | This method invokes the facades and throws School and SchoolBusiness Exception. | Not applicable |
| ServiceLocator | Locate | Façade name | Façade Object | Method used for locating the appropriate façade based on the input name and return the object. Throws SchoolException when any runtime error occurs. | Not applicable. |
| SchoolMarkFacade | studentMarkEntry | MarkVO | Boolean | Method invokes the appropriate BO’s and returns the value to the screens. Handles exceptions , logs it and throws it back to the presentation tier. | Not applicable. |
| MarkBO | studentMarkEntry | MarkVO | Boolean | Method perform validations, calculate the total mark, average, grade and invokes the DAO to store the student mark details in the system. Throws School and SchoolBusinessException. | Refer to section 6.2  for calculating total,average and grade details and the validations to be done. |
| MarkDAO | insertStudentMark | MarkVO | Int | This method should insert the student mark details into the appropriate table based on the student standard category into the system. | Refer to Section 6.3 for selecting the appropriate table based on the student standard category |
| MarkDAO | retriveSubject | StandardCategory | Set<subjects> | This method return the set of subject names retrieved from the appropriate table based on the standard category. | Refer to Section 6.3 for selecting the appropriate table based on the student standard category |



# Algorithms



### Validations

* If the subject mark is greater than 100 or negative values, then throw business exception with error code 510.
* If the subject mark contains alphabets or special characters, throw business exception with error code 511.

### Mark Calculation

**Step 1 :** Get the subject marks from the mark entry screen

**Step 2 :** Calculate the total mark as follows:

**TotalMark = SubjectMark1+ subjectMark2+...+subjectMarkn.**

**Step 3:** Calculate the average mark as follows:

**Average =TotalMark / no. of subjects.**

**Step 4:** Calculate the grade based on the average mark and each subject marks.

|  |  |
| --- | --- |
| Calculation | Grade |
| Average >90  Each subject mark should be greater than or equal to 50 | A |
| Average :70 to 89  Each subject mark should be greater than or equal to 50 | B |
| Average : 50 to 69  Each subject mark should be greater than or equal to 50 | C |
| Average < 50  Any one subject mark is lesser than 50 | F |

### Mark Registration

**Step 1** : Perform all the business validation

**Step 2** : Calculate total, average and grade.

**Step 3 :** Identify the table based on the student Standard category.

|  |  |
| --- | --- |
| Category | Table name |
| Primary(P) | STUDENT\_MARK\_PRIMARY |
| Secondary(S) | STUDENT\_MARK\_SECONDARY |
| HigherSecondary(H) | STUDENT\_MARK\_HIGHER |

**Step 4:** Load the mark details into the system along with the student id.