CSC 440 Applied Software Engineering

Team Project

EKU  09/10/2024

Grade management system

Final report

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# Introduction

## Problem Statement

EKU’s Registrar Office needs to update student course records after receiving student grades from all the faculty at the end of each semester. They need a tool to help them to make the job easy.

## Proposal

We propose a software system to help them manage the grades of students in different semesters.

# System Description

1. Add new grades of courses for each student to a database: The office can gather all the Excel files from the faculty, and put them in a folder. The formats of the names for the folder and Excel files are:

Folder name: “**Grades [Year] [Semester]**”

(Ex., “**Grades 2021 Spring**”, “**Grades 2023 Fall**”)

File name: “**[Course Prefix] [Number] [Year] [Semester]**”

(Ex., “CSC 440 2021 Fall”, “MAT 234 2027 Spring”)

1. Edit a grade for a student: There might be some mistakes in the Excel files provided by the faculty. The system shall allow the office to edit the grade of a course for a student. Editing a grade means changing the grade, deleting the grade, and/or adding a grade to the database.
2. Print a report card (or transcript) for a student: The system shall let them print a report card (or transcript) for a selected student. The report card (or transcript) should list student’s name, id, overall gpa, and a lists of courses with grades that he/she has taken before.

The office has designed the first version the Excel file and database tables. They are not sure if the design is good enough for keeping the data. You will help them to make the database design sound and complete.

# System Requirements

## Functional Requirements

1. The system shall allow the user to add a new single grade to the database.
   1. The user shall press the “Add a Grade” button to add a new grade to the database.
   2. The system shall display a form to allow a user to enter student id, grade, and CRN.
   3. The user shall enter the data and press the “Submit” button.
   4. The system shall check the existence of the new record.
      1. If the record exists, the system shall display an error message to the user.

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* + 1. If the record doesn’t exist, the system shall add the record to the database.

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1. The system shall allow the user to import a folder of excel files to add grades.
   1. The user shall press the “Import Grades” button.
   2. The user shall select the folder to be imported.

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* 1. The system shall check the existence of the records.
     1. If the records exist, the system shall skip inserting those records to avoid duplicates
     2. A screenshot of a computer

        Description automatically generatedIf the records do not exist, the system shall add the records to the database and send a confirmation message to the user

1. The system shall allow the user to edit existing records in the database.
   1. The user shall select the desired record from the list.

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* 1. The user shall press the “Edit Grade” button.
  2. A screenshot of a computer screen

     Description automatically generatedThe system shall display a form to allow the user to edit the selected record.
  3. The user shall enter the data and press the “Submit” button.
  4. The system shall check the existence of the edited record.
     1. If the record exists, the system shall display an error message to the user.

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* + 1. If the record doesn’t exist, the system shall add the record to the database and send a confirmation message to the user.

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1. The system shall allow the user to delete an existing record from the database.
   1. The user shall select the desired record from the list.

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* 1. The user shall press the “Delete Record” button.
  2. The system shall display a confirmation message.

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* + 1. If the user presses the “Confirm” button, the system shall delete the selected record from the database.

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* + 1. If the user presses the “Cancel” button, the system shall close the confirmation message window.

1. The system shall allow the user to print the transcript for a selected student.
   1. The user shall click the “Print Transcript” button.
   2. The system shall display a form to allow the user to enter the student id for the desired student transcript.

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* 1. The user shall click the “Print” button.
  2. The system shall output a formatted pdf containing the student’s name, id, overall GPA, and a list of courses with grades that the student has taken.

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## Non-functional Requirements

1. The system shall support use on Windows 10 and 11 operating systems.
2. The system shall support use of a relational database.
3. The system shall support the following naming conventions for Excel files and folders
   1. Folder name: “**Grades [Year] [Semester]**”

(Ex., “**Grades 2021 Spring**”, “**Grades 2023 Fall**”)

* 1. File name: “**[Course Prefix] [Number] [Year] [Semester]**”

(Ex., “CSC 440 2021 Fall”, “MAT 234 2027 Spring”)

# Use Case Diagrams



Five use cases have been identified for this software system. First, the system shall allow the user to import grades from folder on their computer. The data stored in Excel files should be read and inserted into the database. Second, the system shall allow the user to add a single grade. The entered grade information should be inserted into the database. Third, the system shall allow the user to delete a grade. When the user selects the grade record to be deleted, the record should be removed from the database. Fourth, the system shall allow the user to edit a grade. When the user selects the grade record to be edited, the system should prompt the user to enter the updated grade information. The system should then update the grade record in the database. Fifth, the system shall allow the user to print the transcript of a student. The user shall enter a student id and the system shall create a PDF file for the user to print.

# Class Diagram

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# Sequence Diagrams

## A black background with white text and blue circles Description automatically generatedUse Case 1: Import Grades

## Use Case 2: Add Grade

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## Use Case 3: Delete Grade

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## Use Case 4: Edit Grade

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## Use Case 5: Print Transcript

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# Activity Diagrams

## Use Case 1: Import Grades

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## Use Case 2: Add Grade

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## Use Case 3: Delete Grade

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## Use Case 4: Edit Grade

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## Use Case 5: Print Transcript

**A diagram of a system

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# State Diagram

A diagram of a flowchart

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# Database Design

## ER Diagram

A close-up of a computer code

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## Table Schema

A diagram of a course

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# Conclusion

Adequately following and implementing these requirements and models shall lead to a satisfactory software solution for a grade management system (GMS) suitable for EKU’s Registrar Office business needs.