Course Title	:	Systems Analysis and Design
Assignment Number	:	MCA(1)/014/Assign/12
Assignment Marks	:	100
Weightage	:	25%

This assignment has four questions. Answer all questions. Each question is of 20 marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Question 1: Develop SRS for Grade Card Generation System. Use IEEE format. Make necessary assumptions

Solution : **Introduction**

Purpose

Attendance tracker 1.0 is a web application for university instructors to use to record the attendance status of their students using their name and photo, automatically send email

messages to absent and tardy students, and track class and individual attendance statistics from any computer with Internet access. Instructors will log in, add classes with unique settings and build student lists which only they can access and take attendance for.

Document Conventions

Underlined text is used to emphasize importance.
Each requirement specifies if it depends on higher level requirements being complete before implementation.

Intended Audience and Reading Suggestions

This document is intended mainly for developers with parts customers can easily get important information from (features and use cases).

Product Scope

Attendance Tracker is a web application that uses a database to store information about instructors, classes, students and their attendance record, and sends email to students without the use of any email client software on the computer it is accessed from.
It will help teachers to take attendance faster and easier, correspond with students effortlessly, and provide statistics about attendance.
The target customer is a university or a department of a university, who will purchase one copy of Attendance Tracker to be used by all of their instructors.

References

No outside references at this time.

Overall Description

Product Perspective

Attendance Tracker is a self-contained product requiring a web server and a SQL database.

Product Functions

- User logs in
- User manages list of classes
  - user manages list of students for each class
    - System handles importing RONet files
- User takes attendance for classes
- System sends email messages automatically
- System calculates statistics about attendance
- System exports attendance record to a spreadsheet document

User Classes and Characteristics

- Small class instructor
  - Takes full attendance most days, grading is based on attendance. They use all the features.
- Large class instructor
  - Uses email features regularly but attendance is still too time consuming because of the number of students.

Operating Environment

Attendance Tracker will run on a Windows Server with a SQL database. The web interface will run in Firefox, Safari, and Internet Explorer, and at least one of the browsers in Windows XP, Ubuntu Linux, and Mac OSX.

Design and Implementation Constraints

Attendance Tracker will be implemented using a SQL database, C#, and ASP.net. It will take advantage of secure http and use cookies to track logins.

User Documentation

The web application will feature a help page, with the appropriate sections referenced by each page of the user interface with directions how to do common tasks and special cases of use.

Assumptions and Dependencies

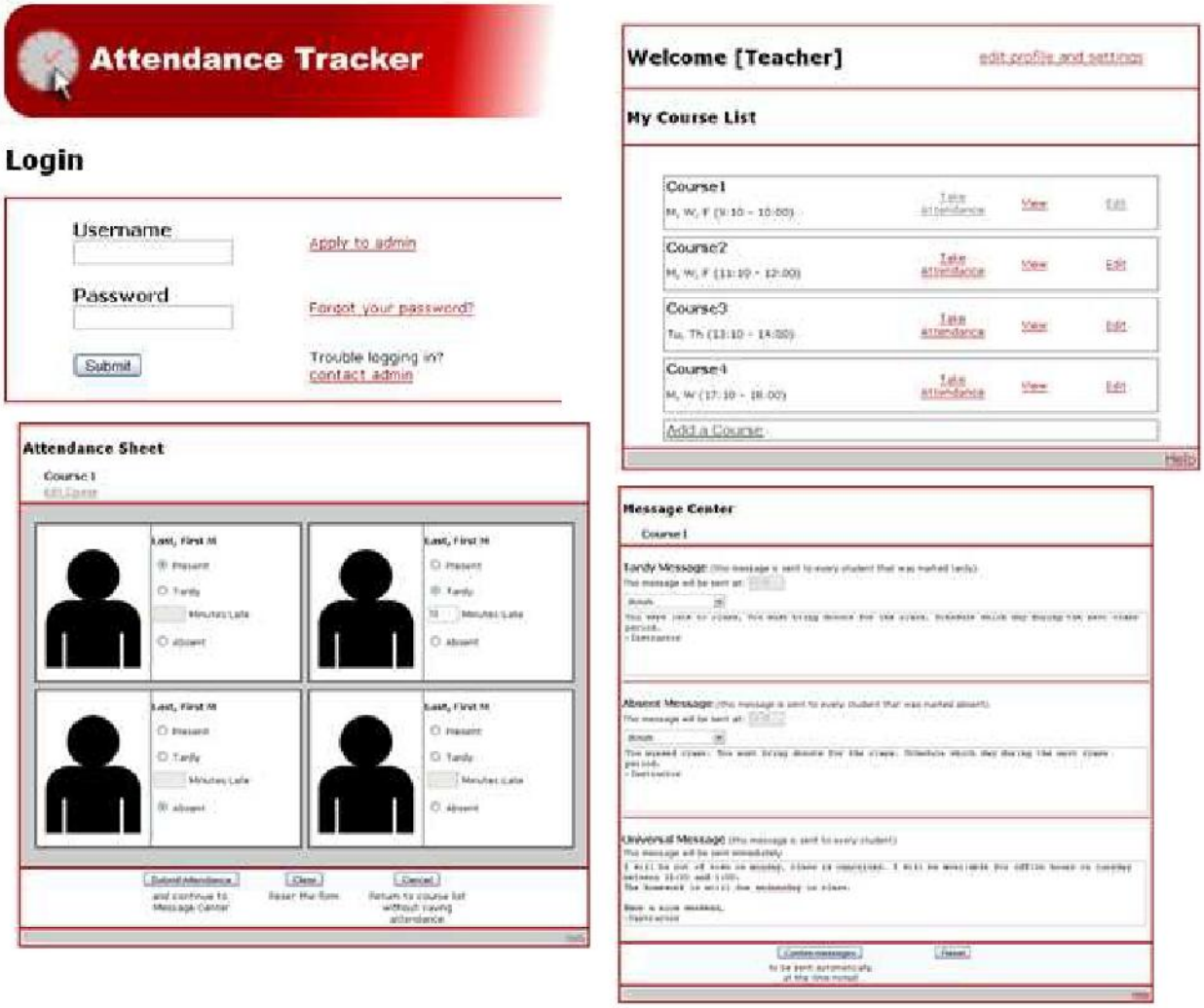
All users are expected to know how to use basic Internet tools.

External Interface Requirements

User Interfaces

Most pages in the user interface are forms that the user edits and submits, with the exception of viewing class lists and attendance records and statistics.

User interface prototypes:



Hardware Interfaces

The user navigates and inputs information with a mouse and keyboard.

Software Interfaces

Attendance Tracker uses a SQL database to store all information about users (instructors), courses, students, student attendance records, and macro email messages.

Communications Interfaces

Attendance Tracker is a web application used through a web browser. It sends email messages automatically at a time specified by each user, without opening an email client on the user's computer. The login will use HTTPS (secure http) to protect passwords and HTTP and HTTPS to send information back and forth.

System Features

Secure login by instructor to display only their own classes

4.1.1 Description and Priority

Instructors (users) will log in securely to prevent unauthorized changes to attendance records. They will have exclusive access to their classes, no other Instructor can even view it in the course list. Priority is high, security is crucial.

4.1.2 Stimulus/Response Sequences

User enters user name and password. Incorrect name or password will prompt for change and offer system administrator contact information.

4.1.3 Functional Requirements

REQ-1: SQL database is set up
REQ-2: User list login is added

Importing and updating class lists from RONet files.

4.2.1 Description and Priority

Instructor can use RONet files to speed up building the student list for a class, while preventing user error in data entry. Priority is low, there is an alternative method for building the class list.

4.2.2 Stimulus/Response Sequences

Instructor goes to class list for a course where they would normally build it manually, and clicks to import a file. They choose the file and upload it. The system parses it and makes student records in the class for each student in the file. The instructor can import the file again after they have already done so once to update the class list. Students in the file not in the list are added, and students in the list and not in the file are deleted.

4.2.3 Functional Requirements

REQ-1: RONet files must be able to be parsed
REQ-2: Class list building is already complete
REQ-3: File upload feature is built

Detailed student information cards

4.3.1 Description and Priority

The system will store data about each student such as contact information such as email address (for automatic email contact if a student is tardy or absent), their picture, and any notes the Instructor makes about them. Priority is medium-high, the information cards are not important to the main functionality of Attendance Tracker.

4.3.2 Stimulus/Response Sequences

The Instructor can view a Student Information Card from the class list found from the course page or as linked from the attendance page. A small, summary version of the Student Information Card is displayed on the attendance page with a reasonably sized thumbnail picture. The instructor can view and edit the student's attendance record from here as well as view statistics about the student's attendance (i.e., days tardy/absent, % of class missed)

4.3.3 Functional Requirements

REQ-1: File upload is complete (for student photos)
REQ-2: SQL database is set up

Attendance taking with pictures

4.4.1 Description and Priority

A grid of mini Student Information Cards is displayed with radio-buttons for present, absent, and tardy. When the tardy option is selected, a "minutes late" number box (with +/- buttons) is enabled and automatically set to the difference in time between the start of class (as set in the course information) and the current time. Priority is very high, this is the main purpose of Attendance Tracker.

Stimulus/Response Sequences

4.4.2 The Instructor logs in and selects attendance for the current course from the course list. They use the grid of pictures and names to identify the students faces without interaction or call their name if they do not see the student. This might also help the Instructor become familiar with their students and make class more personal.

Functional Requirements

4.4.3 REQ-1: SQL database is set up

REQ-2: Time functions are in place for tardy minutes

Email center for sending tardy, absent, and reminder messages with macro messages

4.5.1 Description and Priority

This enables the instructor to notify students of their absence or tardy and the consequences that entails. It also allows the instructor to send a message to the entire class reminders or notification emails at any time without launching an email client. Priority is medium, this is not part of the attendance taking or record keeping.

4.5.2 Stimulus/Response Sequences

The instructor takes attendance during or after class, but before the email deadline they set during course setup, and are taken to the Message Center. They approve the default messages they have set up for both tardy and absent students or change to a different macro message, or enter a new subject and body that will not be saved after it is sent at the message deadline. They optionally enter a reminder message to be sent immediately.

The Instructor can log in at any time of any day and access the reminder message portion of the Message Center and send email messages to the whole class immediately.

The address the instructor has entered in the course settings will be used for the reply-to email so that responses and failed delivery notifications get sent to them.

4.5.3 Functional Requirements

REQ-1: Server is set up to send email

REQ-2: SQL database is set up

Statistic summaries for each student and cumulative for the class

4.6.1 Description and Priority

Statistics such as total tardies and collective minutes tardy, percent of days tardy, total days absent, percent of days absent are calculated by the system based on all days that attendance was submitted. Each student's individual statistics are shown on the class list on this page for comparison.
Priority is medium-low, this data can be calculated after exporting the attendance record.

4.6.2 Stimulus/Response Sequences

The instructor views statistics for the class at the end of the semester to assess grading leniency or extra credit; students who were rarely or never absent will be apparent in their individual statistics and questionable students' statistics are easy to compare with the class totals/averages.

4.6.3 Functional Requirements

REQ-1: SQL database is set up

Data can be exported to spreadsheets

4.7.1 Description and Priority

The class attendance record showing student's attendance by day with absent and tardy days marked (tardy days with minutes late) with totals at the end of each row for each student and the bottom of each column to observe attendance trends day by day.
This attendance record can optionally be downloaded as a tab-delimited text file which can be easily imported with spreadsheet editor.

Priority is medium, the table displayed could be copied as well, but possibly with formatting issues.

4.7.2 Stimulus/Response Sequences

The Instructor views the attendance record for a class, and is shown the table of data. They click to download the file. The system makes a temporary text file and provides the user with a link or automatic download request. The Instructor saves the file then opens it with Microsoft Excel or OpenOffice Calc, then saves the spreadsheet format if they want to keep it or make changes. This can also be used if the instructor decides to discontinue use of Attendance Tracker.

4.7.3 Functional Requirements

REQ-1: File creating/writing is functional on the server
REQ-2: Files can be created in the Excel (.xls) file type

Question 2: How will you check the correctness of a DFD? What are Do's and Don'ts while drawing a DFD. Use examples or illustrations

Solution: It is essential to evaluate all DFDs carefully to determine if they are correct. Errors, omissions and inconsistencies can occur for several reasons, including mistakes in drawing the diagrams. But the presence of what appears to be an error may in fact point out a deficiency in the system or a situation in which users are not aware of how certain processes operate.

These questions are useful in evaluating data flow diagrams:

- Are there any unnamed components in the data flow diagram (data flows, processes, stores, inputs or outputs)?
- Are there any data stores that are input but never referenced?
- Are there any processes that do not receive input?
- Are there any processes that do not produce output?
- Are there any processes that serve multiple purposes? If so, simplify by exploding them into multiple processes that can be better studied).
- Are there data stores that are never referenced?
- Is the inflow of data adequate to perform the process?
- Is there excessive storage of data in a data store (more than the necessary details)?
- Is the inflow of data into a process too much for the output that is produced?
- Are aliases introduced in the system description?

- Is each process independent of other processes and dependent only on the data it receives as input?

Do's and Don't do

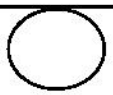
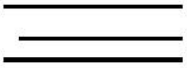
- Dont cross other lines when drawing DFD
- Diagram must be on single page
- Each process has unique reference number, and each set of number have unique name
- Use DFD shapes as described in rules

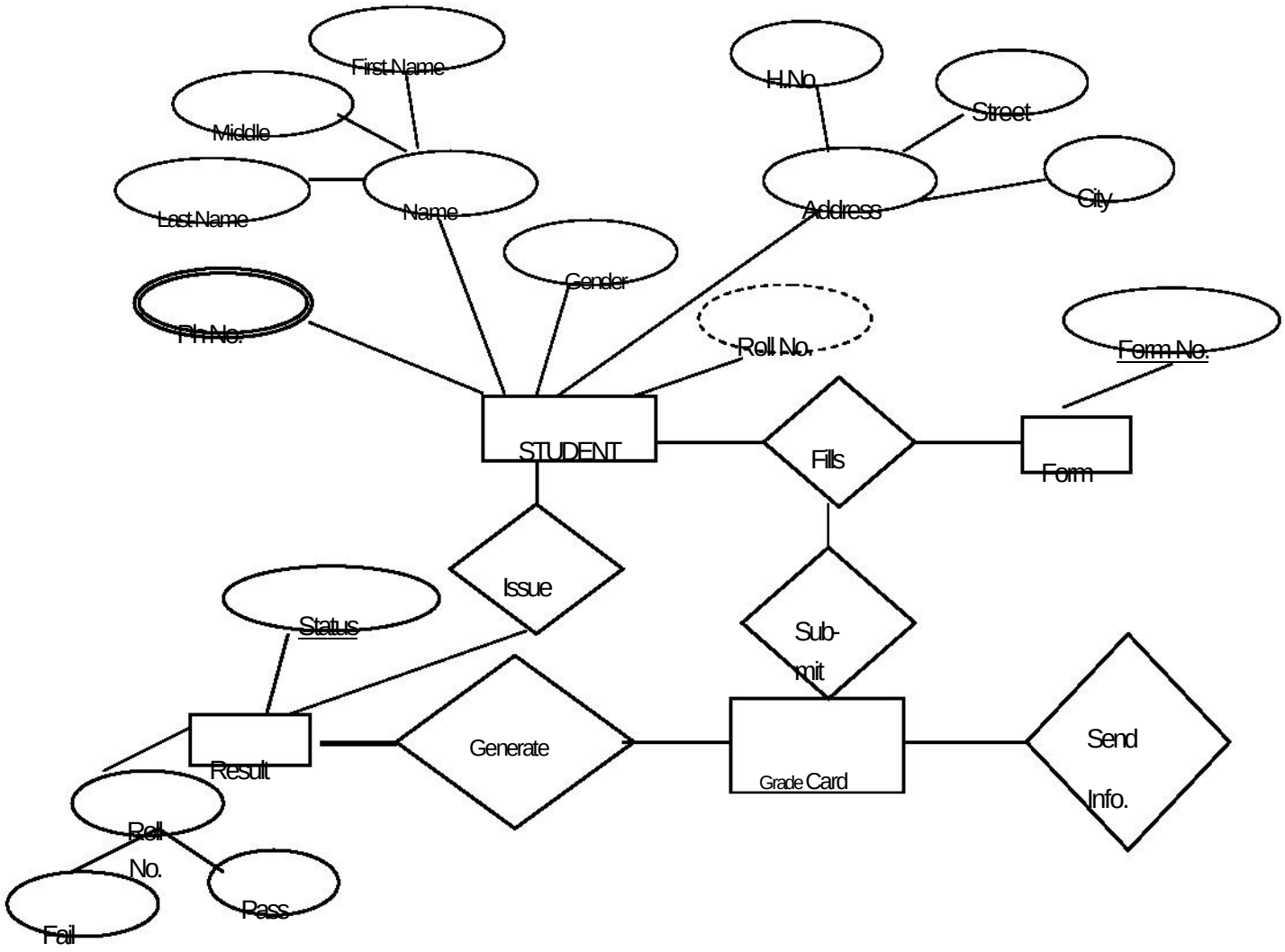
Question 3: Draw ERD for Grade Card Generation System. Make necessary assumptions.

Solution :

ENTITY RELATIONSHIP DIAGRAM

Entity relationship diagram expresses the overall logical structure of a database graphically. It shows the relationship between different entities. The entities can have composite, multivolume or derived attributes. The entities and their attributes are: -

Symbols	Meanings
	Data flow
	Process
	Data store
	Entity



ENTITY RELATIONSHIP DIAGRAM

Question 4: What are various functions of MIS? What are the benefits of it to the organization which implements MIS.

Solution : A **management information system** (**MIS**) provides information that is needed to

manage organizations efficiently and effectively. Management information systems are not only computer systems - these systems encompass three primary components: technology, people (individuals, groups, or organizations), and data/information for decision making. Management information systems are distinct from other information systems in that they are designed to be used to analyze and facilitate strategic and operational activities in the organization. Academically, the term is commonly used to refer to the study of how individuals, groups, and organizations evaluate, design, implement, manage, and utilize systems to generate information to improve efficiency and effectiveness of decision making, including systems termed decision support systems, expert systems, and executive information systems. Most business schools (or colleges of business administration within universities) have an MIS department, alongside departments of accounting, finance, management, marketing, and sometimes others, and grant degrees (at undergrad, masters, and PhD levels) in MIS.

Benefits:-

The following are some of the benefits that can be attained for different types of management information systems

- Companies are able to highlight their strengths and weaknesses due to the presence of revenue reports, employees' performance record etc. The identification of these aspects can help the company improve their business processes and operations.
- Giving an overall picture of the company and acting as a communication and planning tool.

- The availability of the customer data and feedback can help the company to align their business processes according to the needs of the customers. The effective management of customer data can help the company to perform direct marketing and promotion activities.
- Information is considered to be an important asset for any company in the modern competitive world. The consumer buying trends and behaviours can be predicted by the analysis of sales and revenue reports from each operating region of the company .

---------- THE END ----------