Preliminary Design

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The Electronic Spreadsheet
Automated Teaching Assistant

Pear Software

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Section 1.1: Product Overview and Summary

A computer automated spreadsheet file assessor and grader will take a major burden off of busy college professors that do not have time to grade a large amount of assignments. Our clients, Dr. Scott Hunter and Ms. Jami Cotler have the problem of too many papers to grade and not enough time to do it. Pear Software can offer them a solution, one which will cut down on the tedium of grading Microsoft Excel Spreadsheet assignments for the Computer Science 010 class at Siena College, which a large amount of students are required to take. The e-SATA program will grade lab and pre-lab excel files using a master answer key.

The greater part of development will take place in the facilities provided for by Dr. Lederman, which is the Software Engineering Lab in Roger Bacon at Siena College. The operating of our software will take place in the Computer Science labs of Roger Bacon, in a Windows XP environment. Maintenance environments are not finalized at this stage, however they are assumed to be the similar machines as ones currently in the Roger Bacon Computer Labs.
Section 1.2: User Displays & User Command Summaries

This prototype is a screen of the initial interface any user will see when they access e-SATA. If they are already registered with the system, they will simply type in their user name and password to gain access to the system. If they are not a registered user with the system, they will have the option to create a new account from this screen as well by clicking New User. Should a user forget their password, clicking Forgot Password will send it to their registered email.
This is the screen that a user is brought to by clicking New User on the Login Screen. They are asked to input basic information such as their name and email. They also must create a password of their choice. e-SATA will use the user’s email address that they type in, verify it, and make that the person’s user name. Finally, the student must also select a course and section. Below is the message that pops up when the first time user has successfully filled out all of the forms correctly.
The first of the following two screens is for the first time a lecture or lab instructor logs into the system. Since the Course Administrator originally creates their account, the Lab Instructor or Lecture Instructor will be prompted to change their password upon their first login.
This is the screen that the Lecture Instructor or Lab Instructor is taken to after successfully changing their password upon their first login.
This screen introduces the interface of what it is like when a student is logged in. The student can view their grades as well as show feedback that they received. They can also download the files, or they have the ability to export a table with their grades to excel.
The student can view their grades as well as show feedback for pre labs that they received. They can also download the files, or they have the ability to export a table with their grades to excel.
Here the student will use these forms to upload their completed files for grading. They can submit a pre-lab multiple times, however a lab can only be submitted once.
The students will be able to view their attendance on this screen, showing the dates they were late and the dates they were absent, only from lab.
Here the student will be able to view detailed feedback of what was marked incorrect on their submitted file. The feedback provides them with an error, error type and also provides the amount of points that were deducted.
On the Class Labs and Pre Labs, the students will be able to both view and download the selected template files that were provided by the Course Administrator. They will use these files for their work.
On this Screen the Lab Instructor has the ability to view all the students selected and also sort them by name, section, or grade. The lab instructor can change sections from “All” to more specific sections as to filter their result. This screen also allows the Lab Instructor to take attendance and drop the student from their section.
This screen allows the Lab Instructor to edit the overall grade of specific assignments of a student chosen in the 3 tier main menu. It also allows the Lab Instructor to see the feedback of the assignment, download the actual document submitted and also export the grades to an excel file.
This screen allows the Lab Instructor to edit the overall grade of specific assignments of a student chosen in the 3 tier main menu. It also allows the Lab Instructor to see the feedback of the assignment, download the actual document submitted and also export the grades to an excel file.
This screen allows the Lab Instructor to edit the attendance of a student chosen in the 3 tier main menu. It shows the dates for which the student was marked absent or late and allows the Lab Instructor to remove the record of their absence or tardiness or to add another one.
This screen allows the Lab Instructor to view the feedback screen of files submitted by a student chosen in the 3 tier main menu. It allows the Lab Instructor to award partial credit or override point deduction that was made by e-SATA incorrectly.
This screen shows the most common errors of a selected file submitted by whatever choice was made in the 3 tier main menu. In this case it is of all the students of all the sections.
This screen allows the Lab Instructor to download or view the files pertaining to the course which were uploaded by a Course Administrator. These files are model or template files for assignments.
This screen allows the Lab Instructor to modify his account information and change his password.
This screen allows the Lab Instructor to view all pending requests and either accept or override student requests to switch sections.

<table>
<thead>
<tr>
<th>Students</th>
<th>Section</th>
<th>Request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown, John</td>
<td>7</td>
<td>Switch to Section 8</td>
</tr>
</tbody>
</table>
On this screen the Lecture Instructor has the ability to view all the students selected and also sort them by name, section, or grade. The lab instructor can change sections from “All” to more specific sections as to filter their result. This screen also allows the Lab Instructor to drop student from their section.
This screen allows the Lecture Instructor to edit the overall grade of specific assignments of a student chosen in the 3 tier main menu. It also allows the Lab Instructor to see the feedback of the assignment, download the actual document submitted and also export the grades to an excel file.
This screen allows the Lecture Instructor to edit the overall grade of specific assignments of a student chosen in the 3 tier main menu. It also allows the Lecture Instructor to see the feedback of the assignment, download the actual document submitted and also export the grades to an excel file.
This screen allows the Lecture Instructor to view the attendance of a student chosen in the 3 tier main menu. It shows the dates for which the student was marked absent or late.
This screen allows the Lecture Instructor to view the feedback of a selected file of a student chosen in the main 3 tier menu.
This screen shows the most common errors of a selected file submitted by whatever choice was made in the 3 tier main menu. In this case it is of all the students of all the sections.
This screen allows the Lecture Instructor to download or view the files pertaining to the course which were uploaded by a Course Administrator. These files are model or template files for assignments.
This screen allows the Lecture Instructor to modify his account information and change his password.
This screen allows the Lecture Instructor to view all pending requests and either accept or override student requests to switch sections.
On this screen, the Course Administrator has the ability to edit any student’s or teacher’s information. They also have the ability to edit in case a problem should arise with the existing information.
This screen is available to the Course Administrator in case a student has trouble creating an account. It is also used to create teacher accounts as well, assigning both a course and section to the teacher.
On this screen the Course Administrator can create specific teachers and assign them their appropriate lab or lecture sections. They also have the option to delete or edit the existing associations.
This screen will be used by the Course Administrator to create lecture sections as well as lab sections. These created classes will be used when a lab instructor or a lecture instructor would like to view grades and sort them according to class.
This screen is used by the Course Administrator to upload the answer keys for the labs. They can also edit and delete the keys from this screen as well.
The Administrator will have the ability to view all lab grades of all students in all courses. They can also export a table of grades to excel.
The Administrator will have the ability to view all pre-lab grades of all students in all courses. They can also export a table of grades to excel.
The Administrator will use this screen to upload lab template files. They can also view files, download and delete them as well.
On the My Account tab, the Administrator will be able to edit their personal information and change their password.
Section 1.3: Detailed Data Flow Diagrams

Key

- SOURCES/SINKS
- DATA STORE
- USERS
- PROCESS
Context Diagram
Level 0

Manage Users Request

User

Password
Assigner
Grade-or-Attendance
Answer-Key
Feedback
New-Password
Level 2 Diagram

e-SATA

Graphical User Interface

Student

Lab Instructor

Lecture Instructor

Course Administrator

Database

Automated Grading Process

- Assignment
- Feedback
- New-Password
- Verified-Graded-Assignment

- Feedback
- New-Password

- Feedback

- Password
- Class-Grades-in-Spreadsheet

- Feedback
- New-Password
- All-Grades

- Data
- Grades
- Feedback
- Assignment
- Answer-Key

- Data
Section 1.4: Data Dictionaries

Current Diagram is: Context - Level 0

Answer-Key

Data Flow

Location:
Context - Level 0  ( CONTEXT )
Source: User ( Source/Sink )
Dest: Manage Users Request ( Process )

Description: Will be uploaded by the Course Administrator in order to grade Labs and Pre-Labs.

Assignment

Data Flow

Location:
Context - Level 0  ( CONTEXT )
Source: User ( Source/Sink )
Dest: Manage Users Request ( Process )

Description: Will be submitted by the Student for grading.

Feedback

Data Flow

Location:
Context - Level 0  ( CONTEXT )
Source: Manage Users Request ( Process )
Dest: User ( Source/Sink )

Description: Will be given promptly to the user after e-SATA grades the Labs and Pre-Labs.

Grade-or-Attendance

Data Flow

Location:
Context - Level 0  ( CONTEXT )
Source: Manage Users Request ( Process )
Dest: User ( Source/Sink )

Description: Grade will be given with the Feedback. Attendance will be kept in Database.
Manage Users Request

Process #: 0

Location:
Context - Level 0 (CONTEXT)

Input Flows:
Answer-Key
Assignment
Password

Output Flows:
New-Password
Feedback
Grade-or-Attendance

Description: The entire program in general.

New-Password Data Flow

Location:
Context - Level 0 (CONTEXT)

Source: Manage Users Request (Process)
Dest: User (Source/Sink)

Description: Will be sent via-email to any user that requires it.

Password Data Flow

Location:
Context - Level 0 (CONTEXT)

Source: User (Source/Sink)
Dest: Manage Users Request (Process)

Description: Will be required to access e-SATA.

User Source/Sink

Location:
Context - Level 0 (CONTEXT)

Input Flows:
New-Password
Feedback
Grade-or-Attendance

Output Flows:
Answer-Key
Assignment
Password

Description: User consists of Student, Lab Instructor, Lecture Instructor, and Course Administrator.
Current Diagram is:  **System - Level 1**

**Answer-Key**

*Location:*

  **System - Level 1 (0)**

  **Source:** Course Administrator (Source/Sink)
  **Dest:** Manage Web Based User Request (Process)

**Description:** Will be uploaded by the Course Administrator in order to grade Labs and Pre-Labs.

**Assignment**

*Location:*

  **System - Level 1 (0)**

  **Source:** Student (Source/Sink)
  **Dest:** Manage Web Based User Request (Process)

**Description:** Will be submitted by the Student for grading.

**Class-Grades-in-Spreadsheet**

*Location:*

  **System - Level 1 (0)**

  **Source:** Manage Web Based User Request (Process)
  **Dest:** Lab Instructor (Source/Sink)
  **Source:** Manage Web Based User Request (Process)
  **Dest:** Course Administrator (Source/Sink)
  **Source:** Manage Web Based User Request (Process)
  **Dest:** Lecture Instructor (Source/Sink)

**Description:** Instructors and Course Administrator will be able to export all of the students’ grades into an Excel Spreadsheet.

**Course Administrator**

*Location:*

  **System - Level 1 (0)**

  **Input Flows:**
  - Class-Grades-in-Spreadsheet
  - New-Password
  - Feedback
  **Output Flows:**
  - Password
  - Answer-Key

**Description:** Course Administrator will be able to export the all of the student grades into an Excel Spreadsheet. Create New Passwords. Get feedback from a given Lab. Upload the Answer keys for the given Lab and Pre-Lab.
Data

Location:
System - Level 1 (0)

Source: Database Server (File)
Dest: Manage Web Based User Request (Process)
Source: Manage Web Based User Request (Process)
Dest: Database Server (File)

Description: Consists of the Students submitted Lab and Pre-Lab assignments.

Database Server

Location:
System - Level 1 (0)

Input Flows:
Data

Output Flows:
Data

Description: Stores all data.

Feedback

Location:
System - Level 1 (0)

Source: Manage Web Based User Request (Process)
Dest: Lab Instructor (Source/Sink)
Source: Manage Web Based User Request (Process)
Dest: Course Administrator (Source/Sink)
Source: Manage Web Based User Request (Process)
Dest: Lecture Instructor (Source/Sink)
Source: Manage Web Based User Request (Process)
Dest: Student (Source/Sink)

Description: Will be given promptly to the user after e-SATA grades the Labs and Pre-Labs.
Lab Instructor

Location:
System - Level 1 ( 0 )

Input Flows:
Class-Grades-in-Spreadsheet
New-Password
Feedback
Unverified-Graded-Assignment

Output Flows:
Password
Verified-Graded-Assignment

Description: Lab Instructor will be able to export all of the student grades into an Excel Spreadsheet. They will receive both feedback on the given lab and also the graded assignment from e-SATA. It will send back the verified grade to the database and student.

---------------------------------------------------------------------------------------------------------------

Lecture Instructor

Location:
System - Level 1 ( 0 )

Input Flows:
Feedback
New-Password
Class-Grades-in-Spreadsheet

Output Flows:
Password

Description: Lecture Instructor will be able to export all of the student grades into an Excel Spreadsheet. Be able to look at the feedback from any given Lab.
Manage Web Based User Request

Process #: 1

Location:
System - Level 1 (0)

Input Flows:
Password
Assignment
Password
Verified-Graded-Assignment
Password
Answer-Key
Data
Password

Output Flows:
Feedback
New-Password
Class-Grades-in-Spreadsheet
New-Password
Feedback
Unverified-Graded-Assignment
Class-Grades-in-Spreadsheet
New-Password
Feedback
Data
Feedback
New-Password
Class-Grades-in-Spreadsheet

New-Password

Location:
System - Level 1 (0)

Source: Manage Web Based User Request (Process)
Dest: Student (Source/Sink)

Source: Manage Web Based User Request (Process)
Dest: Lab Instructor (Source/Sink)

Source: Manage Web Based User Request (Process)
Dest: Course Administrator (Source/Sink)

Source: Manage Web Based User Request (Process)
Dest: Lecture Instructor (Source/Sink)

Description: Will be sent via-email to any user that requires it.
Password

Location:
System - Level 1  ( 0 )
Source: Lab Instructor  ( Source/Sink )
Dest: Manage Web Based User Request  ( Process )
Source: Course Administrator  ( Source/Sink )
Dest: Manage Web Based User Request  ( Process )
Source: Lecture Instructor  ( Source/Sink )
Dest: Manage Web Based User Request  ( Process )
Source: Student  ( Source/Sink )
Dest: Manage Web Based User Request  ( Process )

Description: Will be required to access e-SATA.

-----------------------------------------------

Student

Location:
System - Level 1  ( 0 )

Input Flows:
Feedback
New-Password

Output Flows:
Password
Assignment

Description: Will be given prompt feedback on Labs and Pre-labs. It will also allow for the submission of labs and pre labs.

-----------------------------------------------

Unverified-Graded-Assignment

Location:
System - Level 1  ( 0 )

Source: Manage Web Based User Request  ( Process )
Dest: Lab Instructor  ( Source/Sink )

Description: Students graded lab done by e-SATA.

-----------------------------------------------

Verified-Graded-Assignment

Location:
System - Level 1  ( 0 )

Source: Lab Instructor  ( Source/Sink )
Dest: Manage Web Based User Request  ( Process )

Description: Lab Instructor will review students lab to give partial credit where needed.
Current Diagram is: e-SATA - Level 2

All-Grades Data Flow
Location: e-SATA - Level 2
Source: Graphical User Interface (Process)
Dest: Course Administrator (Source/Sink)

Description: All Students grades can be viewed by the Course Administrator.

Answer-Key Data Flow
Location: e-SATA - Level 2
Source: Database (File)
Dest: Automated Grading Process (Process)
Source: Course Administrator (Source/Sink)
Dest: Graphical User Interface (Process)

Description: Will be uploaded by the Course Administrator in order to grade Labs and Pre-Labs.

Assignment Data Flow
Location: e-SATA - Level 2
Source: Student (Source/Sink)
Dest: Graphical User Interface (Process)
Source: Database (File)
Dest: Automated Grading Process (Process)

Description: Will be submitted by the Student for grading.

Automated Grading Process Process
Process #: 3
Location: e-SATA - Level 2
Input Flows:
Answer-Key
Assignment
Output Flows:
Unverified-Graded-Lab
Grades
Feedback

Description: e-SATA automatically grading the Labs.
Class-Grades-in-Spreadsheet

**Location:** e-SATA - Level 2 (0)

- **Source:** Graphical User Interface (Process)
- **Dest:** Lab Instructor (Source/Sink)
- **Source:** Graphical User Interface (Process)
- **Dest:** Lecture Instructor (Source/Sink)
- **Source:** Graphical User Interface (Process)
- **Dest:** Course Administrator (Source/Sink)

**Description:** Instructors and Course Administrator will be able to export the student grades into an Excel Spreadsheet.

Course Administrator

**Location:** e-SATA - Level 2 (0)

**Input Flows:**
- Feedback
- New-Password
- Class-Grades-in-Spreadsheet
- All-Grades

**Output Flows:**
- Password
- Answer-Key

**Description:** Course Administrator will be able to export the student grades into an Excel Spreadsheet. Create New Passwords. Get feedback from a given Lab. Upload the Answer keys for the given Lab and Pre-Lab.

Data

**Location:** e-SATA - Level 2 (0)

- **Source:** Graphical User Interface (Process)
- **Dest:** Database (File)
- **Source:** Database (File)
- **Dest:** Graphical User Interface (Process)

**Description:** Will consist of Lab files submitted by the student.
Database

Location: e-SATA - Level 2 (0)

Input Flows:
- Unverified-Graded-Lab Grades
- Feedback Data

Output Flows:
- Answer-Key Assignment Data

Description: Stores all data.

Feedback Data Flow

Location: e-SATA - Level 2 (0)

Source: Graphical User Interface (Process)
Dest: Student (Source/Sink)
Source: Automated Grading Process (Process)
Dest: Database (File)
Source: Graphical User Interface (Process)
Dest: Lab Instructor (Source/Sink)
Source: Graphical User Interface (Process)
Dest: Lecture Instructor (Source/Sink)
Source: Graphical User Interface (Process)
Dest: Course Administrator (Source/Sink)

Description: Will be given promptly to the user after e-SATA grades the Labs and Pre-Labs.

Grades Data Flow

Location: e-SATA - Level 2 (0)

Source: Automated Grading Process (Process)
Dest: Database (File)

Description: Will be stored in the database and be viewed by the Course Administrator, Lab and Lecture Instructor.
Graphical User Interface

Process #: 2
Location: e-SATA - Level 2 (0)

Input Flows:
- Assignment
- Password
- Verified-Graded-Assignment
- Password
- Password
- Password
- Answer-Key
- Data

Output Flows:
- Feedback
- New-Password
- Unverified-Graded-Assignment
- New-Password
- Feedback
- Class-Grades-in-Spreadsheet
- Feedback
- New-Password
- Class-Grades-in-Spreadsheet
- Feedback
- New-Password
- Class-Grades-in-Spreadsheet
- All-Grades
- Data

Lab Instructor
Location: e-SATA - Level 2 (0)

Input Flows:
- Unverified-Graded-Assignment
- New-Password
- Feedback
- Class-Grades-in-Spreadsheet

Output Flows:
- Verified-Graded-Assignment
- Password

Description: Lab Instructor will be able to export the student grades into an Excel Spreadsheet. It will receive both feedback on the given lab and also the graded assignment from e-SATA. As well as send back the verified grade to the database and student.
Lecture Instructor  

*Location:* e-SATA - Level 2  

*Input Flows:*  
Feedback  
New-Password  
Class-Grades-in-Spreadsheet  

*Output Flows:*  
Password

**Description:** Lecture Instructor will be able to export the student grades into an Excel Spreadsheet. Be able to look at the feedback from any given Lab.

---

New-Password  

*Location:* e-SATA - Level 2  

*Source:* Graphical User Interface (Process)  
*Dest:* Student (Source/Sink)  
*Source:* Graphical User Interface (Process)  
*Dest:* Lab Instructor (Source/Sink)  
*Source:* Graphical User Interface (Process)  
*Dest:* Lecture Instructor (Source/Sink)  
*Source:* Graphical User Interface (Process)  
*Dest:* Course Administrator (Source/Sink)

**Description:** Will be sent via-email to any user that requires it.

---

Password  

*Location:* e-SATA - Level 2  

*Source:* Student (Source/Sink)  
*Dest:* Graphical User Interface (Process)  
*Source:* Lab Instructor (Source/Sink)  
*Dest:* Graphical User Interface (Process)  
*Source:* Lecture Instructor (Source/Sink)  
*Dest:* Graphical User Interface (Process)  
*Source:* Course Administrator (Source/Sink)  
*Dest:* Graphical User Interface (Process)

**Description:** Will be required to access e-SATA.
**Student**

_Please provide the location._

**Input Flows:**
- Feedback
- New-Password

**Output Flows:**
- Assignment
- Password

**Description:** Students graded lab done by e-SATA.

---

**Unverified-Graded-Assignment**

SetActive Location:
- e-SATA - Level 2
- (0)

Source:
- Graphical User Interface (Process)

Dest:
- Lab Instructor (Source/Sink)

---

**Unverified-Graded-Lab**

SetActive Location:
- e-SATA - Level 2
- (0)

Source:
- Automated Grading Process (Process)

Dest:
- Database (File)

**Description:** Students graded lab done by e-SATA.

---

**Verified-Graded-Assignment**

SetActive Location:
- e-SATA - Level 2
- (0)

Source:
- Lab Instructor (Source/Sink)

Dest:
- Graphical User Interface (Process)
Current Diagram is: **Grading System - Level 3**

**Answer-Key**

*Location:*

- **Grading System - Level 3** (0)
  - **Source:** Database (File)
  - **Dest:** File Grader (Process)

**Description:** Will be uploaded by the Course Administrator in order to grade Labs and Pre-Labs.

**Assignment**

*Location:*

- **Grading System - Level 3** (0)
  - **Source:** Interface (Process)
  - **Dest:** Database (File)
  - **Source:** Database (File)
  - **Dest:** File Grader (Process)

**Description:** Will be submitted by the Student for grading.

**Attendance**

*Location:*

- **Grading System - Level 3** (0)
  - **Source:** Interface (Process)
  - **Dest:** Database (File)

**Database**

*Location:*

- **Grading System - Level 3** (0)
  - **Input Flows:**
    - Attendance
    - Assignment
    - Verified-Graded-Assignment
    - Feedback
    - Unverified-Graded-Lab
  - **Output Flows:**
    - Grades
    - Feedback
    - Assignment
    - Answer-Key

**Description:** Stores all data.
Feedback

Location:
Grading System - Level 3 (0)
Source: Database (File)
Dest: Interface (Process)
Source: File Grader (Process)
Dest: Database (File)

Description: Will be given promptly to the user after e-SATA grades the Labs and Pre-Labs.

File Grader

Process #: 5
Location:
Grading System - Level 3 (0)
Input Flows:
Assignment
Answer-Key
Output Flows:
Feedback
Unverified-Graded-Lab

Grades

Location:
Grading System - Level 3 (0)
Source: Database (File)
Dest: Interface (Process)

Description: Will be stored in the database and be viewed by the Course Administrator, Lab and Lecture Instructor.

Interface

Process #: 4
Location:
Grading System - Level 3 (0)
Input Flows:
Grades
Feedback
Output Flows:
Attendance
Assignment
Verified-Graded-Assignment
Unverified-Graded-Lab

Location:
Grading System - Level 3  (0)
Source: File Grader (Process)
Dest: Database (File)

Description: Students graded lab done by e-SATA.

------------------------------------------------------------------------------------------------------------------------

Verified-Graded-Assignment

Location:
Grading System - Level 3  (0)
Source: Interface (Process)
Dest: Database (File)

Description: Lab Instructor will review students lab to give partial credit where needed.
Current Diagram is: Web Interface - Level 3

Accept-or-Deny Data Flow

Location:

Web Interface - Level 3 ( 0 )
Source: Database ( File )
Dest: Login Interface ( Process )

Answer-Key Data Flow

Location:

Web Interface - Level 3 ( 0 )
Source: Display Course Administrator Interface ( Process )
Dest: Database ( File )
Source: Course Administrator ( Source/Sink )
Dest: Display Course Administrator Interface ( Process )

Description: Will be uploaded by the Course Administrator in order to grade Labs and Pre-Labs.

Assignment Data Flow

Location:

Web Interface - Level 3 ( 0 )
Source: Display Student Interface ( Process )
Dest: Database ( File )
Source: Student ( Source/Sink )
Dest: Display Student Interface ( Process )

Description: Will be submitted by the Student for grading.

Course Administrator Source/Sink

Location:

Web Interface - Level 3 ( 0 )

Input Flows:
Grade-Information
Feedback
New-Password

Output Flows:
Answer-Key
Grade-Information
Login
Password-Reset

Description: Course Administrator will be able to export the student grades into an Excel Spreadsheet. Create New Passwords. Get feedback from a given Lab. Upload the Answer keys for the given Lab and Pre-Lab.
Database

**Location:**

Web Interface - Level 3 ( 0 )

**Input Flows:**
- Information
- Information
- Answer-Key

**Output Flows:**
- Information
- Information

**Input Flows:**
- Password
- Username
- Information
- Information
- Assignment
- Verified-Graded-Lab

**Output Flows:**
- Accept-or-Deny
- Information
- Information
- Unverified-Graded-Lab

**Description:** Stores all data.

-----------------------------------------------------------------------------------------------------------------------------

Display Course Administrator Interface

**Process #:** 10

**Location:**

Web Interface - Level 3 ( 0 )

**Input Flows:**
- Information
- Login-Success
- Answer-Key
- Grade-Information

**Output Flows:**
- Information
- Answer-Key
- Grade-Information
- Feedback

-----------------------------------------------------------------------------------------------------------------------------
Display Lab Instructor Interface

Process #: 8
Location: Web Interface - Level 3 (0)

Input Flows:
- Information
- Unverified-Graded-Lab
- Login-Success

Output Flows:
- Information
- Verified-Graded-Lab
- Grade-Information
- Feedback

Display Lecture Instructor Interface

Process #: 9
Location: Web Interface - Level 3 (0)

Input Flows:
- Login-Success
- Information

Output Flows:
- Grade-Information
- Information
- Feedback

Display Student Interface

Process #: 7
Location: Web Interface - Level 3 (0)

Input Flows:
- Login-Success
- Information
- Assignment

Output Flows:
- Information
- Assignment
- Grade-Information
- Feedback
Feedback

Location:
Web Interface - Level 3 (0)

Source: Display Student Interface (Process)
Dest: Student (Source/Sink)

Source: Display Lecture Instructor Interface (Process)
Dest: Lecture Instructor (Source/Sink)

Source: Display Course Administrator Interface (Process)
Dest: Course Administrator (Source/Sink)

Source: Display Lab Instructor Interface (Process)
Dest: Lecture Instructor (Source/Sink)

------------------------------------------------------------------------------------------------------------

Grade-Information

Location:
Web Interface - Level 3 (0)

Source: Display Lecture Instructor Interface (Process)
Dest: Lecture Instructor (Source/Sink)

Source: Display Student Interface (Process)
Dest: Student (Source/Sink)

Source: Course Administrator (Source/Sink)
Dest: Display Course Administrator Interface (Process)
Source: Display Course Administrator Interface (Process)
Dest: Course Administrator (Source/Sink)
Source: Display Lab Instructor Interface (Process)
Dest: Lecture Instructor (Source/Sink)

Description: Students grade which can be viewed by Course Administrator, Lecture and Lab Instructor.

------------------------------------------------------------------------------------------------------------
**Information**

*Location:*

Web Interface - Level 3  

(0)

*Source:* Display Lecture Instructor Interface (Process)

*Dest:* Database (File)

*Source:* Database (File)

*Dest:* Display Lecture Instructor Interface (Process)

*Source:* Display Course Administrator Interface (Process)

*Dest:* Database (File)

*Source:* Database (File)

*Dest:* Display Course Administrator Interface (Process)

*Source:* Database (File)

*Dest:* Display Lab Instructor Interface (Process)

*Source:* Display Lab Instructor Interface (Process)

*Dest:* Database (File)

*Source:* Database (File)

*Dest:* Display Lab Instructor Interface (Process)

*Source:* Database (File)

*Dest:* Database (File)

*Source:* Display Student Interface (Process)

*Dest:* Database (File)

*Source:* Database (File)

*Dest:* Display Student Interface (Process)

**Description:** Information will be stored in the database coming from all of the users.

------------------------------------------------------------------------------------------------------------
Login

Location: Web Interface - Level 3  ( 0 )
Source: Lecture Instructor  ( Source/Sink )
Dest: Login Interface  ( Process )
Source: Student  ( Source/Sink )
Dest: Login Interface  ( Process )
Source: Lecture Instructor  ( Source/Sink )
Dest: Login Interface  ( Process )
Source: Course Administrator  ( Source/Sink )
Dest: Login Interface  ( Process )

Description: User will be prompted to input username and password.

Login Interface

Process #: 6

Location: Web Interface - Level 3  ( 0 )

Input Flows:
Login
Password-Reset
Login
Password-Reset
Accept-or-Deny
Password-Reset
Login
Password-Reset

Output Flows:
Login-Success
New-Password
New-Password
Login-Success
Password
Username
Login-Success
Login-Success
New-Password
New-Password
Login-Success

Location:
Web Interface - Level 3 (0)
Source: Login Interface (Process)
Dest: Display Lecture Instructor Interface (Process)
Source: Login Interface (Process)
Dest: Display Student Interface (Process)
Source: Login Interface (Process)
Dest: Display Lab Instructor Interface (Process)
Source: Login Interface (Process)
Dest: Display Course Administrator Interface (Process)

Description: User successfully logs into e-SATA.

New-Password

Location:
Web Interface - Level 3 (0)
Source: Login Interface (Process)
Dest: Lecture Instructor (Source/Sink)
Source: Login Interface (Process)
Dest: Student (Source/Sink)
Source: Login Interface (Process)
Dest: Lecture Instructor (Source/Sink)
Source: Login Interface (Process)
Dest: Course Administrator (Source/Sink)

Description: Will be sent via email to any user that requires it.

Password

Location:
Web Interface - Level 3 (0)
Source: Login Interface (Process)
Dest: Database (File)

Description: Will be required to access e-SATA.
**Password-Reset**

*Location:* Web Interface - Level 3  
*Source:* Lecture Instructor (Source/Sink)  
*Dest:* Login Interface (Process)  
*Source:* Student (Source/Sink)  
*Dest:* Login Interface (Process)  
*Source:* Lecture Instructor (Source/Sink)  
*Dest:* Login Interface (Process)  
*Source:* Course Administrator (Source/Sink)  
*Dest:* Login Interface (Process)

**Description:** Resets user’s Password.

---

**Student**

*Location:* Web Interface - Level 3  
*Input Flows:*  
New-Password  
Grade-Information  
Feedback  
*Output Flows:*  
Login  
Password-Reset  
Assignment

**Description:** Will be able to few their own grade information along with feedback from any given Lab. Also submit Labs and Pre-labs.

---

**Unverified-Graded-Lab**

*Location:* Web Interface - Level 3  
*Source:* Database (File)  
*Dest:* Display Lab Instructor Interface (Process)

**Description:** Students graded lab done by e-SATA.

---

**Username**

*Location:* Web Interface - Level 3  
*Source:* Login Interface (Process)  
*Dest:* Database (File)

**Description:** Will be Students email and will be required to log into e-SATA.
Verified-Graded-Lab

Data Flow

Location:
Web Interface - Level 3 ( 0 )
Source: Display Lab Instructor Interface ( Process )
Dest: Database ( File )

Description: Lab Instructor will review students lab to give partial credit where needed.

Section 1.5: Logical Data Stores

All information for e-SATA will be stored on an Oracle database. As per Dr. Hunter and Ms. Cotler, we will need to store submitted Excel files from all users, grading keys submitted from the Course Administrator, and grading specifications in a separate directory. As of now we plan to have the Oracle database contain only the locations the files rather than containing the files directly in the database.
Section 1.6: Logical Format of Data Files and Databases

The following is a list of tables, their elements, and the modules for which they will be used within e-SATA. Field corresponds to the variable name the elements are expected to have within that actual database.

**Student Table**

| Modules: | Web Interface User Login, Grading Application User Login. |

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Type</th>
<th>Size</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>StudentID</td>
<td>The student's unique identifier.</td>
<td>varchar</td>
<td>20</td>
<td>alphanumeric, 20 characters</td>
</tr>
<tr>
<td>Password</td>
<td>The student's password.</td>
<td>varchar</td>
<td>255</td>
<td>size large for encryption, alphanumeric, 20 chars</td>
</tr>
<tr>
<td>FirstName</td>
<td>The student's first name.</td>
<td>varchar</td>
<td>40</td>
<td>only characters, 40 characters</td>
</tr>
<tr>
<td>LastName</td>
<td>The student's last name.</td>
<td>varchar</td>
<td>50</td>
<td>only characters, 50 characters</td>
</tr>
<tr>
<td>LectureSection</td>
<td>Foreign key. Links to the lecture section that the student is enrolled in.</td>
<td>varchar</td>
<td>10</td>
<td>alphanumeric, 10 characters</td>
</tr>
<tr>
<td>LabSection</td>
<td>Foreign key. Links to the lab section that the student is enrolled in.</td>
<td>varchar</td>
<td>10</td>
<td>alphanumeric, 10 characters</td>
</tr>
</tbody>
</table>

**Professors Table**

| Modules: | Web Interface User Login, Grading Application User Login. |

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Type</th>
<th>Size</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProfessorID</td>
<td>The professor's unique identifier.</td>
<td>varchar</td>
<td>20</td>
<td>alphanumeric, 20 characters</td>
</tr>
<tr>
<td>Password</td>
<td>The professor's password.</td>
<td>varchar</td>
<td>255</td>
<td>size large for encryption, alphanumeric, 20 chars</td>
</tr>
</tbody>
</table>

field: FirstName
    The first name of the professor.
    type: varchar size: 40
    *must be only characters, <= 40 varchars

field: LastName
    The last name of the professor.
    type: varchar size: 50
    *must be only characters, <= 50 varchars

field: Type
    Defines the type of instructor. (e.g. Lab Instructor or Lecture Instructor)
    type: varchar size: 20
    *must be alphanumeric, being with character and be <= 20 varchars

**Administrators Table**

Modules:
    Web Interface User Login, Grading Application User Login.

field: AdminID
    Primary key.
    type: varchar size: 20
    *must be alphanumeric, being with character and be <= 20 varchars

field: Password
    The administrator’s password.
    type: varchar size: 255 *size large for encryption
    *must be alphanumeric and be <= 20 varchars

field: FirstName
    The first name of the administrator.
    type: varchar size: 40
    *must be only characters, <= 40 varchars

field: LastName
    The last name of the administrator.
    type: varchar size: 50
    *must be only characters, <= 50 varchars

**Sections Table**

Modules:

field: SectionID
    Primary key.
    type: varchar size: 10
    *must be alphanumeric, being with character and be <= 10 varchars

field: CourseID
    Foreign key. Links the section to a specific course.
    type: varchar size: 10
    *must be alphanumeric, being with character and be <= 10 varchars

field: Type
Contains the type of section (e.g. Lab or Lecture)
type: varchar size: 20
*must be alphanumeric, being with character and be <= 20 varchars

Courses Table
Modules:

field: CourseID
  Primary key.
type: varchar size: 10
  *must be alphanumeric, being with character and be <= 10 varchars

field: CourseName
  A short description of the course.
type: varchar size: 40
  *must be alphanumeric, being with character and be <= 40 varchars

field: Semester
  The semester the course takes place (e.g. Spring or Fall)
type: var size: 10
  *must be alphanumeric, being with character and be <= 10 varchars

field: Year
  The year the course takes place (e.g. Spring or Fall)
type: int size: 4
  *must be in yyyy format

Attendance Table
Modules:

field: AutoNum
  Primary key. Will be filled in automatically be the database.
type: int size: 10

field: StudentID
  Foreign key. Links each record of attendance to a student.
type: varchar size: 10
  *must be alphanumeric, being with character and be <= 10 varchars

field: Date
  The date the attendance was taken.
type: date size: 10
  *must be in mm/dd/yyyy format.

field: LabNumber
  The lab number when the attendance was taken.
type: int size: 4
  *must be positive

field: Attendance
  Where the attendance is stored for the specific date. (e.g. Present or Not Present)
type: varchar size: 10
  * must be alphanumeric, being with character and be <= 10 varchars
**Files Table**

Modules:

field: FileName  
Primary key. Also the name of the file that was uploaded to the system.  
type: varchar size: 30  
*must be alphanumeric, being with character and be <= 30 varchars

field: AdminID  
Foreign key. Links each uploaded file to the person that uploaded the file.  
type: varchar size: 10  
*must be alphanumeric, being with character and be <= 10 varchars

field: CourseID  
Foreign key. Links each uploaded file to a specific course.  
type: varchar size: 10  
*must be alphanumeric, being with character and be <= 10 varchars

field: Type  
The type of file that was uploaded. (e.g. Template or Answer Key)  
type: varchar size: 15  
* must be alphanumeric, being with character and be <= 15 varchars

**Labs Table**

Modules:

field: FileName  
Primary key. Also the name of the lab that was uploaded to the system.  
type: varchar size: 30  
*must be alphanumeric, being with character and be <= 30 varchars

field: StudentID  
Foreign key. Links each uploaded lab to the student that uploaded the lab.  
type: varchar size: 10  
*must be alphanumeric, being with character and be <= 10 varchars

field: EditedBy  
Foreign key. If a grade has been changed then this field will contain the name of the lab instructor that changed the grade.  
type: varchar size: 10  
*must be alphanumeric, being with character and be <= 10 varchars

field: Type  
The type of file that was uploaded. (e.g. Pre-Lab or Lab)  
type: varchar size: 10  
* must be alphanumeric, being with character and be <= 10 varchars

field: SystemGrade  
The grade assigned to the lab by the e-SATA system.  
type: int size: 3  
*must be positive

field: PartialCredit
Any partial or extra credit that was given for this lab to the student.
type: int size: 3
field: Feedback
    A description of any mistakes or comments on the lab.
type: varchar size: 150
    *must be alphanumeric, being with character and be <= 150 varchars

Instructs Table
    Modules:

    field: SectionID
        Primary key and foreign key. Links to a SectionID from the Sections table.
type: varchar size: 10
        *must be alphanumeric, being with character and be <= 10 varchars

    field: ProfessorID
        Foreign key. Links each professor to one or more sections.
type: varchar size: 10
        *must be alphanumeric, being with character and be <= 10 varchars
Section 2.1: Structure Diagrams

Structure charts are graphical representations similar to that of the Data Flow Diagrams. They depict the subroutine and function hierarchy in the program. By viewing structure charts, one can identify and fully understand the manner in which the program is set up.

Key

MODULE

LIBRARY MODULE
Lab Instructor

- Create Account
  - Retrieve Forgotten Password
  - View Most Common Mistakes by Lab Section
- Login
  - View All Students in Lab
  - View Most Common Mistakes by Course/Sections
- Change Account Information
  - View Individual Student
  - Keep Attendance
Lecture Instructor

- Create Account
- Change Account Information
- View Student Requests
- Login
- View Grades of Students in a course
- View Common Mistakes in lecture instructor section
- Retrieve Forgotten Password
- Drop Student from Section
- Compare Student Mistakes
Course Administrator

Create Accounts
  - Create New Course
  - View All Grades from Lab and Lecture for specific course

Login
  - View Lab, Lecture, Instructor, Course Admin, and Student Profiles
  - Manage/Upload Answer Keys for e-SATA

View All Information Labs and Lecture Sessions
  - Select Individual profiles for Account Information
  - Manage/Upload Template Files
Section 2.2: Use Case Scenarios

There will be four determined users of the e-SATA application. This is determined in a fashion so that proper user rights and functions are assigned as there will be more than one type of client using the application. The following four users will be:

- Student
- Lab Instructor
- Lecture Instructor
- Course Administrator

Student

Students will be able to make submissions of their pre-lab and labs files. After submitting their pre-lab they will also have the right to resubmit the pre-lab if they want to make changes before the lab session after feedback is received. The feedback screen will provide comments to incorrect cells to show mistakes; if a mistake is not limited to one cell there will be one dedicated cell to hold all of the notes on these mistakes. If a mistake is limited to only one cell a comment will be added to incorrect cells directly. Students will also have the ability to view their own lab grades. If a student misses a lab and attends another to make it up, the software will be able to recognize the discrepancy and resume normal function with a lab instructor override.

Lab Instructor

Lab Instructors will be able to view the profile of any student in a lab session. A profile encompasses the grades and attendance of a student. Viewing the profile signifies the ability to view and edit the students’ grade. e-Sata will grade the pre-lab and lab, and then the lab instructors will scan over the e-Sata assessment and adjust anything that was marked incorrectly (i.e. formulas), or assigning partial credit as necessary. Lab Instructors will also be able to get feedback on what errors or mistakes made by students have the highest percentage. Feedback from other lab sessions will also be available to Lab Instructors. Lab Instructors will be able to keep attendance using the application and perform overrides.

Lecture Instructor

Lecture Instructors will have the right to view their students’ grades and view statistics and feedback from all lab sessions. The feedback includes what errors or mistakes made by students have the highest percentage.

Course Administrator

The Course Administrator will be able to view all the grades from all the sections. The Course Administrator will also have full access rights to edit and upload answer keys used by e-Sata to grade the pre-labs and labs.
Section 2.3: Functional Requirements

This section is an outline of the Use Case scenarios seen above. It describes the functions of the four types of users and possible options and actions that they have while using the system. They are outlined in the following manner; Student, Lab Instructor, Lecture Instructor, Course Administrator.

I) Student:

- Create an account with the following information:
  - First Name.
  - Last Name.
  - Email.
    - The system will use the email address as the user name which will be required when logging into the system.
    - The system will verify the email address is not already in use or taken by another account in the system.
  - Password.
  - Lab Section.
  - Lecture Section.
  - A confirmation email will be sent containing account information.

- Login in using email and password.
- Retrieve a forgotten password.
  - The password will be emailed to the user’s email account.

- Change the following account information:
  - Password.
    - The new password will be emailed to the user’s account.
  - First Name.
  - Last Name.
  - Lab Section.
  - Lecture Section.

- Download template files from the system for pre-labs and labs.
- View attendance.
- Upload a pre-lab or lab to the system.
  - Select the pre-lab or lab number to upload.
  - Browse to the pre-lab or lab file.
  - The system will verify the file is of the appropriate extension.
  - The system will verify the file name conforms to a standard naming convention.
- View feedback of a submitted pre-lab.
- Resubmit a graded pre-lab.
• View feedback on submitted pre-labs and labs.
  o View grades of submitted labs.
  o Select a specific pre-lab or lab to view the following feedback:
    • The submitted file.
    • List of errors and mistakes.
      • Location of error.
      • Type of error.
  o Download from the system any submitted pre-labs or labs.
• View any labs that the student may have missed.
  o View if the lab has been made up and what teacher and lab section the lab has been made up with.
II) Lab Instructor:
- Login in using an email and password.
  - Required to change password on first login.
- Retrieve a forgotten password.
  - The password will be emailed to the user’s email account.
- Change the following account information:
  - Password.
    - The new password will be emailed to the user’s account.
- View a list of all students they teach with the ability to sort by name, grade, and section.
  - Ability to drop a student from their lab sections.
  - Accept or deny pending changes of sections or labs made by students.
  - Ability to filter students by section.
  - Ability to sort by name and/or grade.
- Select an individual student to view the profile of the student.
  - View attendance of that student.
  - View grades for that student.
  - Select whether or not a student has submitted a pre-lab.
  - Change grades for a particular lab.
    - Add in extra points for things such as Skills Checks.
    - Add in partial credit.
  - View markup of each lab that the student has completed.
    - Markup consists of mistakes or missed points.
  - Ability to drop the student from their section.
- View student requests to change lab section to a section taught by the lab instructor.
  - View all pending requests.
  - Ability to approve or deny request to change lab section.
- View a list of the most common mistakes for a specific lab from their lab sections.
  - Ability to filter on a particular section.
- Keep attendance for every student in a lab instructor’s sections.
  - The system will allow the lab instructor to input one of three choices for each student’s attendance (present, not present, late).
  - The system will show an absence for a specific date when the students logs in.
III) Lecture Instructor:

- Login in using a user name and password.
  - Required to change password on first login.
- Retrieve a forgotten password.
  - The password will be emailed to the user’s email account.
- Change the following account information:
  - Password.
    - The new password will be emailed to the user’s account.
- View a list of all students they teach with the ability to sort by name, grade, and section.
  - Ability to drop a student from their lab sections.
  - Accept or deny pending changes of sections or labs made by students.
  - Ability to filter students by section.
  - Ability to sort by name and/or grade.
- Select an individual student to view the profile of the student.
  - View attendance of that student.
  - View grades for that student.
  - View markup of each lab that the student has completed.
    - Markup consists of mistakes or missed points.
  - Ability to drop the student from their section.
- View student requests to change lecture section to a section taught by the lecture instructor.
  - View all pending requests.
  - Ability to approve or deny request to change lecture section.
- View a list of the most common mistakes for all students for a specific lab from any of the user’s lecture sections.
  - Ability to filter on a particular section.
- Select a specific student to view their mistakes compared to common mistakes of other students in that student’s section.
IV) Course Administrator:

- Login in using a user name and password.
- Create the following new user accounts:
  - Student.
  - Lab Instructor.
  - Lecture Instructor.
  - Course Administrator.
- View a table of Students and their information.
  - Filter and/or sort results based on:
    - Course.
    - Lecture section.
    - Lab section.
    - Pre-lab or lab number.
      - Grade for the pre-lab or lab.
      - Grade average for all pre-labs or labs.
- View a table of Lab Instructors and their information.
  - Filter and/or sort results based on:
    - Courses taught.
    - Lab sections taught.
- View a table of Lecture Instructors and their information.
  - Filter and/or sort results based on:
    - Courses taught.
    - Lecture sections taught.
- View a table of Course Administrators and their information.
- Select an individual profile for detailed account information.
  - View the user name and password.
  - Change the user’s password.
  - Change the user’s account type. (e.g. Change an account from Lab Instructor to Lecture Instructor.)
  - Change any other account information such as email address.
- Manage a user’s account.
  - Edit any information corresponding to the account.
  - Edit any lab or lecture sections they are associated with.
  - Delete the account.
- Create a new course with a unique course number.
  - Assign a year and semester to a specific course.
- Create a new lecture section.
  - Assign the lecture section to a course.
  - Assign a Lecture Instructor to the lecture section.
  - Assign a schedule for the section which consists of:
    - The day(s) that the lecture meets. (e.g. MWF)
    - The time that the lecture meets. (e.g. 8:30 AM – 9:25 AM)
    - The system will check that the meeting day(s) and time do not conflict with another lab or lecture section.
  - Assign a room number where the lecture is held.
- Manage lecture sections.
o Edit a lecture section which includes the following information:
  ▪ The course it is assigned to.
  ▪ The day(s) the lecture is held.
  ▪ The time the lecture is held.
  ▪ The room where the lecture is being held.
  o Delete a linked lecture section.

• Create a new lab section.
  o Assign the lab section to a course.
  o Assign a Lab Instructor to the lab section.
  o Assign a schedule for the section which consists of:
    ▪ The day(s) that the lab meets. (e.g. MWF)
    ▪ The time that the lab meets. (e.g. 8:30 AM – 9:25 AM)
    ▪ The system will check that the meeting day(s) and time do not conflict with another
      lab or lecture section.
  o Assign a room number where the lab is held.

• Manage lab sections.
  o Edit a lab section which includes the following information:
    ▪ The course it is assigned to.
    ▪ The day(s) the lab is held.
    ▪ The time the lab is held.
    ▪ The room where the lab is being held.
  o Delete a linked lab section.

• Manage answer keys for e-SATA which are used for the automated grading of pre-labs and labs.
  o Upload answer keys.
    ▪ The system will check that the answer key is a text file.
    ▪ The system will check that the file name conforms to a standard naming convention.
      (e.g. Lab01Key.txt)
    ▪ The system will check that the answer key contains the following information in a
      uniform format:
      • A code to distinguish the type of problem that needs to be graded. (e.g. F for
        formatting, S for skills check)
      • The cell to look at when grading the type of problem noted above. (e.g. B6)
      • The grade weight of the problem
      • Any other pertinent information.
  o Delete any previously uploaded answer keys.
  o Assign a specific answer key to a lab or pre-lab in a course.

• Manage template files.
  o Assign the template file to a course number.
  o Assign the template file to a pre-lab or lab number.
  o Delete a template file.
Use Case Narrative:

e-SATA will be a web-based application that will allow the user to login and perform specific tasks as per their designation as either a student, lab instructor, lecture instructor, or course administrator. e-SATA will communicate directly with a database, being able to submit and retrieve information at the request of the user, assuming the user has the privileges to access that material. Functions include submission of assignments for automated grading, the ability to view or edit grades and attendance, and to view feedback on graded assignments.
Section 3.1: Acceptance Test

E-SATA will undergo a very detailed, rigorous, and precise testing procedure by Pear Software team members, as well as outside members to make it a fair process. All functionality, from administrator’s key submission down to student file submission will all be thoroughly tested until they meet the criteria specified by the team. Security of files, access speed, and user friendliness will also be high priorities in the testing procedure.

Section 3.2: Acceptance Test Example

Please see page 90.
<table>
<thead>
<tr>
<th>Item Being Tested</th>
<th>Testing For</th>
<th>Expected Outcome</th>
<th>Pass</th>
<th>Fail</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Login Screen</td>
<td>Does the screen load?</td>
<td>The screen should load correctly and users will have the ability to type in their login information.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0 New User Screen</td>
<td>Does the screen load?</td>
<td>The screen should load correctly and users will have the ability to type in their personal information.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0 Password Retrieval Screen</td>
<td>Does the screen load?</td>
<td>The screen should load correctly and users will have the ability to type in their username to retrieve the lost password.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0 Student User Screen</td>
<td>Does the screen load?</td>
<td>The screen should load correctly and students will have access to all functions designated to their user type.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 Student User Screen</td>
<td>Are all features available?</td>
<td>All tabs, buttons, and fields should be accessible and clickable.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2 Student User Screen</td>
<td>Lab Grade Screen</td>
<td>All lab grades for the user should be displayed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3 Student User Screen</td>
<td>Pre-Lab Submission Screen</td>
<td>The user can view pre-lab grades and has the option to re-submit files.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4 Student User Screen</td>
<td>Submit File Screen</td>
<td>The user has the option to upload any file for grading.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.5 Student User Screen</td>
<td>Feedback Screen</td>
<td>The user has the option to download feedback from any assignment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0 Lab Instructor Screen</td>
<td>Does the screen load?</td>
<td>All tabs, buttons, and fields should be accessible and clickable.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 Lab Instructor Screen</td>
<td>Grading Screen</td>
<td>The user can choose a specific lab session that allows them to view/edit the student’s grades and attendance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2 Lab Instructor Screen</td>
<td>Feedback Screen</td>
<td>The screen displays the option to select a lab, and view individual student or class errors.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.0 Lecture Instructor Screen</td>
<td>Does the screen load?</td>
<td>All tabs, buttons, and fields should be accessible and clickable.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 3.3: Unit Test

The Unit test is a complete breakdown of all functionalities on every GUI page. It tests every option for features such as buttons, text boxes, and any other way that a user may interact with the interface. If one test fails, the entire section fails.
## Section 3.4: Unit Test Example

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Test Name</th>
<th>Field 1</th>
<th>Field 2</th>
<th>Field 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Test #1</td>
<td><em>Login Interface</em></td>
<td>Field 1</td>
<td>Field 2</td>
<td>Field 3</td>
</tr>
<tr>
<td>Unit Test #2</td>
<td><em>Student Interface (Default Screen)</em></td>
<td>Field 1</td>
<td>Field 2</td>
<td>Field 3</td>
</tr>
<tr>
<td>Unit Test #3</td>
<td><em>Unit Test Name</em></td>
<td>Field 1</td>
<td>Field 2</td>
<td>Field 3</td>
</tr>
<tr>
<td>Unit Test #4</td>
<td><em>Unit Test Name</em></td>
<td>Field 1</td>
<td>Field 2</td>
<td>Field 3</td>
</tr>
<tr>
<td>Unit Test #5</td>
<td><em>Unit Test Name</em></td>
<td>Field 1</td>
<td>Field 2</td>
<td>Field 3</td>
</tr>
</tbody>
</table>
## Test 1 - Login Interface (Main Login Screen and Password Recovery Screen)

<table>
<thead>
<tr>
<th>Unit Test #1</th>
<th>Description of Test</th>
<th>Input</th>
<th>Expected Outcome</th>
<th>Pass/Fail</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.001</td>
<td>Valid Login (Student User)</td>
<td>The student user inputs the correct login information.</td>
<td>The student user’s information processes correctly and they are brought to the student user home screen.</td>
<td>Pass/Fail</td>
<td></td>
</tr>
<tr>
<td>1.002</td>
<td>Valid Login (Lab Instructor User)</td>
<td>The lab instructor user inputs the correct login information.</td>
<td>The lab instructor user’s information processes correctly and they are brought to the lab instructor user home screen.</td>
<td>Pass/Fail</td>
<td></td>
</tr>
<tr>
<td>1.003</td>
<td>Valid Login (Lecture Instructor User)</td>
<td>The lecture instructor user inputs the correct login information.</td>
<td>The lecture instructor’s user information processes correctly and they are brought to the lecture instructor user home screen.</td>
<td>Pass/Fail</td>
<td></td>
</tr>
<tr>
<td>1.004</td>
<td>Valid Login (Course Administrator User)</td>
<td>The course administrator inputs the correct login information.</td>
<td>The course administrator user’s information processes correctly and they are brought to the course administrator user home screen.</td>
<td>Pass/Fail</td>
<td></td>
</tr>
<tr>
<td>1.005</td>
<td>Invalid Login Information (User Name)</td>
<td>The user types in an unregistered or mistaken user name.</td>
<td>A message will prompt the user, stating that their user name was incorrect/unrecognized, and to check for typos.</td>
<td>Pass/Fail</td>
<td></td>
</tr>
<tr>
<td>1.006</td>
<td>Invalid Login Information (Password)</td>
<td>The user types in an unregistered or mistaken password.</td>
<td>A message will prompt the user, stating that their password was incorrect and does not match the user name provided, and to check for typos.</td>
<td>Pass/Fail</td>
<td></td>
</tr>
<tr>
<td>1.007</td>
<td>Password Recovery Screen Button</td>
<td>The user clicks on the Password Recovery Screen button.</td>
<td>The Password Recovery screen is displayed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------</td>
<td>------------------------------------------------------</td>
<td>---------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.008</td>
<td>Password Reset</td>
<td>The user selects the password reset option.</td>
<td>The user’s current password is deleted, a new default password is created, and sent to them via e-mail.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit Test #2</td>
<td>Description of Test</td>
<td>Input</td>
<td>Expected Outcome</td>
<td>Pass/Fail</td>
<td>Comments</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------</td>
<td>--------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>2.001</td>
<td>Initial Display</td>
<td>The user has correctly provided their login information.</td>
<td>The main page for the student is displayed, defaulting to the view lab grade section of the student interface.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.002</td>
<td>Log Out Button</td>
<td>The user clicks on the Log Out button.</td>
<td>The student user is disconnected from the system and sent back to the login screen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.003</td>
<td>Export to Excel Button</td>
<td>The user clicks on the Export to Excel button.</td>
<td>A spreadsheet record of the student's lab grades is sent to the user, prompting them to store it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.004</td>
<td>View Graded Pre-Labs Button</td>
<td>The user clicks on the View Graded Pre-Labs button.</td>
<td>The user moves from the main page to the pre-lab grade display screen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.005</td>
<td>Submit Lab/Pre-Lab Button</td>
<td>The user clicks on the Submit Lab/Pre-Lab button.</td>
<td>The user moves from the main page to the file submission screen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.006</td>
<td>Feedback Button</td>
<td>The user clicks on the Log Out button.</td>
<td>The user moves from the main page to the feedback display screen.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 4.1: Timeline
Section 4.2: Glossary of Terms

**Code** - The symbolic arrangement of data or instructions in a computer program or the set of such instructions.

**Database** - A collection of data arranged for ease and speed of search and retrieval.

**DBMS (Database Management System)** - Software that controls the organization, storage, retrieval, security and integrity of data in a database.

**Gantt Chart** - A chart that depicts progress in relation to time, often used in planning and tracking a project.

**HTML (Hyper Text Markup Language)** – A markup language used to structure text and multimedia documents and to set up hypertext links between documents, used extensively on the World Wide Web.

**Internet** - An interconnected system of networks that connects computers around the world via the TCP/IP protocol.

**Linear Sequential Model / Classic Waterfall Model** – A systematic, sequential approach to software development that begins at the system level and progresses through analysis, design, coding, testing, and support.

**PC (Personal Computer)** - Another name for a microcomputer designed for use by a single user.

**PHP (PHP Hypertext Preprocessor)** – A server-side, cross-platform, HTML-embedded scripting language used to create dynamic web pages. PHP is open source software.

**Software** - Written programs or procedures or rules and associated documentation pertaining to the operation of a computer system and that are stored in read/write memory.

**SQL (Structured Query Language)** - Pronounced "sequel", it is a language that provides an interface to relational database systems.

**TCP/IP (Transmission Control Protocol / Internet Protocol)** - the suite of communications protocols used to connect hosts on the Internet. TCP/IP uses several protocols, the two main ones being Transmission Control Protocol (TCP) and Internet Protocol (IP).