

Pine Email Tutorial - Software Design Document

1. Scope

This document describes the software developed by Art & Sol for the Pine Email Tutorial, developed under contract for Suffolk County Community College. The software is described in three sections:

- 1) Overview
- 2) Java Classes
- 3) CGI Programs

2. Overview

Software developed for this project serves two purposes:

- 1) Provide a partial simulation of the SCCC environment allowing students to practice using the system; and
- 2) Support an on-line test and update a database when a student successfully completes that test.

2.1 Practice Simulations

Art & Sol has developed four simulations allowing students to practice using the system. A sequence of instructions accompanies each simulation, indicating what actions the student should take next. All simulations are implemented as Java applets. The Java classes implemented for these simulations are described in the following section.

A Login simulation is implemented with the LoginX class. This simulation asks a student to log in with a given user id and password, start up Pine, and then quit Pine.

A Read Mail simulation is implemented with the ReadX class. This simulation asks a student to read a specific message and its attachments, and then forward that message to another user.

A Send Mail simulation is implemented with the SendX class. This simulation asks a student to compose a message to a specific user.

A Unix simulation is implemented with the UnixX class. This simulation asks a student to change his or her password, and then list the files in his or her home directory.

2.2 Test

Art & Sol has developed an on-line test that checks a student's understanding of Pine Email and the related SCCC environment. Software for this test is implemented as a series of CGI programs and a single Java applet, all of which are described in the following sections. The test works as follows.

- 1) A form appears, asking the student to register for the exam with his or her full name, student id, and date of birth. This information is processed by the login.cgi program, which verifies that a registered student is attempting to take the test.
- 2) Simple instructions tell the student how to take the test. This information, including the student's user id and a temporary password, is provided by the starttest.cgi program.
- 3) A sequence of test questions guides the student through a simulation of the SCCC environment. This simulation is implemented with the Test java class. To pass the test, a student must correctly:

- * Log in using his or her user id and password
- * Start up Pine email

- * Compose and send a message with an attachment
- * Add an entry to the address book
- * Read a mail message and its attachments
- * Forward a message
- * Quit Pine email
- * Change his or her password
- * List files in the current working directory
- * Log off the system

4) When the student has successfully completed the test, the student is congratulated by the `passtest.cgi` program. The student is also instructed at this time to view the SCCC system etiquette guidelines web page, which must be done to complete the test.

5) When the student chooses to view the SCCC system etiquette guidelines web page, the `elink.cgi` program updates the database appropriately.

3. Java Classes

The four exercises and the test in the Pine Email Tutorial are implemented as Java Applets. Each Applet instantiates a sequence of Simulation subclasses that control what appears on the screen. Arguments to the Simulation constructor indicate message text, spacing, and correct keypresses. The paint method of the Applet invokes the paint method of the Simulation. The first Simulation is instantiated in the init method; the order and nature of the subsequent Simulations are determined by the switch in the keyDown method. The classes that extend Applet are:

- * Test - implements the test portion of the tutorial. Parameters to the applet specify
- * `pass.cgi` - the CGI script to run after the test sequence is successfully completed
- * `target_frame` - the browser frame that the CGI script is to be displayed in
- * `user_id` - user id of the person taking the test
- * `password` - temporary password being used for purposes of the test
- * `user_index` - index to the mSQL database (see below)
- * LoginX - allows the student to practice logging on and starting Pine.
- * ReadX - allows the student to practice reading mail messages and their attachments, and forwarding messages.
- * SendX - allows the student to practice sending email.
- * UnixX - allows the student to practice changing his or her password, and using simple unix commands.

These Applets rely on the following classes:

- * Simulation - superclass defines methods for typing and deleting text, moving the cursor and highlights, and determining whether or not the specified instructions were executed correctly.
- * Screen - defines where various parts of the Simulation will appear.
- * AddAddress - subclass of Simulation simulates adding an entry to the Pine address book.
- * EndUnixCmd - subclass of Simulation prints a response to the previous unix command, then prompts for another.
- * Inbox - subclass of Simulation shows a list of entries from which to choose.
- * MailMessage - subclass of Simulation prints out a block of text and waits for a single keypress command.
- * MainMenu - subclass of Simulation allows the user to select from the Pine main menu.
- * Passwd - subclass of Simulation simulates changing one's password.
- * SendMail - subclass of Simulation supports typing a message to a specified recipient.
- * UnixCmd - subclass of Simulation prompts the user and accepts a typed response which may or may not appear on the screen.
- * YNsend - subclass of Simulation verifies that the user wants to send a mail message.

4. CGI Programs

All CGI programs are written in C. Several make calls to an mSQL database called test. These programs assume that the test database contains a file called Studir with the following fields:

- * UserID - integer used as record key
- * FirstName - string, all caps
- * MiddleName - string, all caps (usually a single initial or blank)
- * LastName - string, all caps
- * UserName - user id or account name
- * PassedTest - Y/N
- * DatePassed - 8 digits indicating date the test was passed: YYYYMMDD
- * SawGuides - Y/N
- * SSNum - 9 digit social security number (student id)
- * DoB - 6 digits indicating date of birth: MMDDYY

The following files are used in the Pine Email Tutorial:

- * Makefile - compiles and links all CGI programs used in the Pine Email Tutorial. Resulting cgi files are copied to the cgi-bin directory.
- * login.c - program called when the form in login.html is submitted. It calls getParameters to get the student's full name, social security number, and birth. It then checks these values against the mSQL test database. If no valid student is found, it calls printFailure. Otherwise, the program checks to see if the student has already taken the test. If the student has already successfully completed the test and looked at the etiquette guidelines, it calls printHaveAcct; if the student just needs to review the guidelines it calls printSeeGuides; otherwise it calls printWelcome.
- * getparams.c - contains the getParameters function. This extracts the full name, student id, and date of birth in the format expected by the mSQL test database's Studir file.
- * printmsgs.c - contains the printWelcome, printFailure, printSeeGuides, and printHaveAcct functions. printWelcome gives the student some brief instructions, a user id and password, and a Start button that initiates a call to starttest.cgi. printFailure lists the values returned by the form, clarifies the expected form of the input, and provides a link back to login.html. printSeeGuides provides a link to elink.cgi, passing along the UserID. printHaveAcct reports the date that the test was passed. All functions assume Content-Type has already been set.
- * starttest.c - program called by function printWelcome, which is called by the program in login.c. This invokes the Test java applet, passing along the appropriate user id, password, and user index parameters.
- * passtest.c - program called by the Test applet when the test has been successfully completed. This updates the database indicating that the test was passed. It also prints a message to the student indicating that the etiquette guidelines must be viewed, and providing a link to elink.cgi.
- * elink.c - program called by either passtest.c or function printSeeGuides (called by login.c). This updates the SawGuides and DatePassed fields in the test database for the given user, and then sets the browser location to <http://www.sunysuffolk.edu/Web/Central/IT/documents/NetPol.htm>.
- * msql.h - header file containing function prototypes for interfacing with mSQL.
- * util.c - contains functions for extracting values entered on HTML forms. Functions called are getword, unescape_url, and plustospace.