

Team Members: Luke Greiner Denis Kalic Abigail McCarthy Robert Tateo Nguyen Truong Patrick White

Software Plan

Java Problem Repository & Education Platform

JPREP

Revision: 1.0 **Date:** 09/18/13

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1 Introduction

1.1 Purpose

The purpose of this document is to formally define the client's, Dr. Darren Lim, problem and offer a solution. This document serves to ensure that both *DeltaTech* and Dr. Darren Lim understand and agree to the problem and solution encompassed in this document.

1.2 *Scope*

This document outlines *DeltaTech*'s current understanding of the problem as outlined by Dr. Darren Lim.

1.3 Audience

This document is intended for the use of Dr. Darren Lim, Dr. Timoth Lederman, students of the Fall '13 Software Engineering class, and members of the *DeltaTech* development team.

2 System Definition

2.1 Problem Definition

The client, Dr. Darren Lim, wants a learning tool for the students of Siena College. The problem, as described by the client, is the need for a delivery system of Java[™] programming problems to students. Although there are other alternatives, such as www.codingbat.com, these do not provide a sufficiently controlled learning environment. Students could discover solutions online, as the problems are static and based on the maintenance of one individual.

2.2 System Justification

DeltaTech's solution, *Java Problem Repository & Education Platform* (JPREP), will provide a secure platform for students to solve problems and faculty to administer questions of their choosing. This will result in a system where the professor can generate unique sets of problems where solutions cannot be found online.

2.3 Goals for the System and Project

DeltaTech's goal for JPREP is to have a web-based assignment system where the problem repository is maintainable by the computer science faculty. This platform will be accessible through any computer with an internet connection via web browser. Each student will have an individual login that will grant them access to assignments administered by their respective professors. The solutions by the students will be compiled and run against the predetermined test cases.

2.4 Constraints on System and Project

Since JPREP will be accessed through the internet, it is essential to have the environment compatible on the latest web browsers. Due to the vast range of ways to access JPREP, the minimum collection of web browsers would be Google Chrome, Mozilla Firefox, Microsoft Internet Explorer, and Apple Safari.

Java[™] language is the focus of JPREP. Other languages may be entered, but the result will be a compiling error.

2.5 Functions to be Provided

- A login screen for users
- An input method for source code
- Ability to run against test cases and receive feedback
- Option to create, edit, and reuse questions

2.6 User Characteristics

There will be two different users recognized by JPREP: Faculty and Students

Faculty will have the ability to:

- Create a course and assign a course code
- Manage courses
- Create problems and test cases that will need to be fulfilled for each problem
- Edit or remove current problems and solutions
- View other faculty's courses and their problems

Students will have the ability to:

- Enter user login credentials
- Switch between current courses
- Input Java[™] source code into compiler for assigned problems
- Review the results with the test cases provided with the problem
- Access an overall list of assignments and their state of completion

2.7 Environments

DeltaTech will use the following environments defined for JPREP:

2.7.1 Development Environment

The development environment listed below is the hardware and the software that *DeltaTech* plans to use during the production phase of JPREP.

Server:

Operating System: CentOS 5.2, Kernal 2.6.18-92e15 Server Name: oraserv.cs.siena.edu CPU Type: Intel Xeon 2.66 GHz Memory: 8GB Memory

Windows Machine: Dell Optiplex 760 Operating System: Microsoft Windows Vista Enterprise Service Pack 2 Processor: Intel® CoreTM2 Duo CPU Model: E7500 Speed: 2.93 GHz Memory (RAM): 4.00 GB System Type: 32-bit

Macintosh Machine: Operating System: Apple Mac OS X Lion Version 10.7.5 Model: iMac 21.5 mid 2011 Processor: Intel core i5 Speed: 2.5 GHz Memory (RAM): 4.00 GB

2.7.2 Operating Environment

The operating environment will be any computer, Mac, Windows, or Linux, with internet access via one of the aforementioned browsers in section 2.4.

2.7.3 Maintenance Environment

The maintenance environment for this project will be the same as the operating environment; however, you will need an administrative login.

2.8 Solution Strategy

DeltaTech will use a form of the Waterfall software development method, which is illustrated in section 3.1. The steps of this model include:

- Defining the problem and gathering information
- Generating and refining prototypes
- Development of the product
- Testing and analysis of data
- Installation of finalized product

Software Plan: Through client and team meetings *DeltaTech* will gather the preliminary information needed to assess the client's problem. A solution strategy will then be developed.

Requirement Specifications: DeltaTech will begin to assemble a more detailed list of functionality and specification requirements from the client.

Preliminary Design: Based on the findings of the requirement specification phase, initial designs will be drafted for JPREP's user interface and program architecture.

Detailed Design: Initial prototypes for JPREP will be refined through further meetings with the client and comparisons with requirement specifications.

Development and Testing: Coding and testing of the product will take place.

Acceptance Test: The final version of JPREP, with full documentation, will be submitted to the client.

2.9 Priority of Features

The capability for faculty and students to login to an account is vital in order for professors to track assignments completed by students. The security of these login credentials is of utmost importance to *DeltaTech* and the client. Although it has not been decided on a system for registration, the client has made it clear that it may not be open registration. Professors will have the ability to create and reuse problems from a database. Professors will also have the ability to group students by class.

For the user side, students will be able to input the requested code, submit their answers, and receive instant feedback on a set of test cases. With this in mind, DeltaTech's first goal is to implement a content management system (CMS). This will allow users to login, and, based on the user, tailor the site according to the account status. Additionally, the ability to submit code, have it compiled, and then receive feedback will be developed. Lastly, the user interface (UI) aspect of the product would be customized according to client specification.

2.10 System Acceptance Criteria

JPREP will have the following features:

- Faculty will be able to manage courses
- Faculty and students will have login credentials
- Students will receive instant results upon compilation of source code
- An intuitive and appealing UI will be implemented

3 Project Plan

3.1 Waterfall Model

The following diagram is known as the Waterfall Model, a sequential design process that helps guide in the software engineering process.



3.2 Organizational Structure

Name	Email	Phone Number
Greiner, Luke	lc29grei@siena.edu	(315) 530-2325
Kalic, Denis	d30kali@siena.edu	(518) 788-8506
McCarthy, Abigail	ak03mcca@siena.edu	(518) 813-0266
Tateo, Robert	rm14tate@siena.edu	(518) 817-7014
Truong, Nguyen	nv03truo@siena.edu	(518) 417-0764
White, Patrick	pm13whit@siena.edu	(781) 690-6612

Luke Greiner

Team Leader

The Team Leader must organize and oversee both client and team meetings, communicate with the client to ensure satisfaction and make certain all deadlines are met.

Denis Kalic

Developer & Co-Webmaster

The Developer must help aid and direct tasks involving programming. The Co-Webmaster will assist the Webmaster in creating and maintaining the *DeltaTech's* website.

Abigail McCarthy

Technical Documenter

The Technical Documenter will keep track of all topics discussed in both client and team meetings, provide the team the recorded notes, and keep an archive of all past created documents.

Robert Tateo

System Administrator

The System Administrator must manage the hardware and software resources for the team. It is the System Administrator's responsibility to keep the team's operating systems running properly. Additionally, the tasks include making sure the team's profiles on the machines are up to date with the required software updates and installations, as well as back up these machines.

Nguyen Truong

Lead Developer

The Lead Developer must structure tasks involving programming and help other members with any problems concerning the project.

Patrick White

Webmaster

The Webmaster will create and manage *DeltaTech's* website ensuring that the site is professional, easy-to-use, and always up to date with the team's documents.

3.3 Staffing and Resource Requirements

In order to successfully accomplish our goals for JPREP each member of *DeltaTech* will hold a different position and will be required to perform multiple tasks throughout the project. *DeltaTech* will be composed of a team leader, web master, system administrator, lead programmer, developer, and document designer.

The development of the project will take place in the software engineering lab of Roger Bacon which consists of both Macs running OS X and Dells running Windows. In addition, in order to store the project's data in a database an Oracle SQL Server will be used.

3.4 Development Schedule



3.5 Project Monitoring and Control Mechanisms

During the design and development process, *DeltaTech* will meet with the client once a week. This is not a concrete schedule as it may change depending on the needs of both parties. Meeting with the client frequently ensures that the team has a correct understanding of the JPREP's requirements and that the project visions coincide with one another. *DeltaTech* holds "official" team meetings twice a week, on Sunday and Wednesday. However, unofficial meetings will be ongoing and planned as needed amongst certain team members.

3.6 Tools and Techniques

DeltaTech has researched various techniques to help prepare to complete the project. To effectively manage resources as a group, *DeltaTech* will use Google Calendar as a way to organize individual and group schedules. Any document handling is done over Google Drive and all documents are shared amongst team members. The client has approved the use of electronics for note taking. This means the use of a computer or voice recorder during meetings is acceptable. In terms of communications, *DeltaTech* does all formal communication through email but also keeps an ongoing texting thread for our group.

3.7 Programming Languages

DeltaTech may use PHP, MySQL, HTML, CSS, JavaScript, Python, and/or Java to develop JPREP. As the project progresses, *DeltaTech* reserves the right to use other languages if need be. Although the target language that users will submit their code in will be Java, this does not necessarily mean that Java will be used in the development project.

3.8 Testing Requirements

Testing of JPREP will not only be done throughout the development phase, but the team plans on having an automated nightly or weekly test of the product as features are added. A final acceptance test will be run, which will ensure that all features outlined in the Software Requirements Specifications document work correctly.

3.9 Supporting Documents Required

To guarantee the satisfaction of the client we will provide the following supporting documents through the development of JPREP:

Project Plan: September 23, 2013 Requirements Specification: October 28, 2013 Preliminary Design: December 2, 2013

3.10 Manner of Demonstration and Delivery

DeltaTech will deliver documents and presentations to the client at various stages of JPREP's development to show its progress.

Project Plan: September 23, 2013 Requirements Specification: October 28, 2013 Preliminary Design: December 2, 2013 Detailed Design: Spring 2014 Acceptance Test: Spring 2014

3.11 Method and Time of Delivery

After the JPREP development and testing has been done the product will then go into the acceptance test. Following acceptance of the product, all source code and additional files shall be given to the client.

3.12 Sources of Information

Meetings with the client, Dr. Darren Lim, will be *DeltaTech's* primary source of information for this project. Similar Java programming sites such as www.codeacademy.edu, www.projecteuler.net, and www.codingbat.com will also be useful tools to supplement the conversations with the client. Other sources of information that will help *DeltaTech* with the process of software development throughout the course of this project are Dr. Lederman's lectures, Dr. Lim's labs, and past Software Engineering projects.

4 Appendices

4.1 Glossary of Terms

CMS- Content **M**anagement **S**ystem, a system that allows publishing, editing, and modifying content

CSS- Cascading Style Sheets, a style sheet language used to format web pages

Google Drive- A cloud storage and synchronization service provided by Google

HTML- HyperText Markup Language, the primary language used to develop and layout websites

Java- the programming language in which students will be asked to respond to questions in, designed by Sun Microsystems

JPREP- Java Problem Repository & Education Platform, the application being developed for the client, Dr. Darren Lim

Mac- a type of computer made by Apple that runs on the operating system Mac OS

MySQL- language that will be used to easily access data from a database

Oracle SQL Server- a database management system used to store and retrieve information from databases

PC- Personal Computer

PHP- PHP **H**ypertext Preprocessor, the web-based scripting language that will be used when developing JPREP

4.2 Team Members' Resumes

The order of the resumes is as follows:

- I. Luke Greiner
- II. Denis Kalic
- III. Abigail McCarthy
- IV. Robert Tateo
- V. Nguyen Truong
- VI. Patrick White

(315) 530-2325

Lc29grei@siena.edu

Present Address

SPOB 2802 Siena College 515 Loudon Rd. Loudonville, NY 12211

EDUCATION

Siena College, Loudonville, NY Bachelor of Science, Computer Science, May 2014 G.P.A. 3.68/3.73 (Overall/Major)

EXPERIENCE

Programmer InternAXA Equitable, Syracuse NYSummer 2013

- Learned the code architecture of the Online Account Access management reporting pages
- Migrated the remaining reporting requirement from the old EQAccess application into the OAA management reporting pages
- Researched and presented GitHub, Rally and Prezi, which help facilitate collaboration in Agile Software Development, to the CIO and SIOs

IT Intern

Pearl Carroll & Associates, Latham NY Spring 2013

- Respond to 1st level Help Desk requests
- Reimage existing desktops including builds, new security identifiers and domain configuration
- Perform server and applications inventory
- Produce Technical Documentation using Microsoft Visio

Operations InternComputer Sciences Corporation, Syracuse NYSummer 2012, Winter2012

- Responded to 1st level Help Desk requests
- Provided Helpdesk support for IT related issues
- Completed daily operations to maintain data integrity
- Created macros in Microsoft Excel using Visual Basic
- Prepared tapes for offsite storage

COMPUTER SKILLS

-Proficient in Java, C, Python, Visual Basic, SQL, MIPS, PHP, JavaScript, HTML, CSS, Struts 2, Tiles

-Familiar with Object Oriented and Procedural Programming

-Excellent with Microsoft Office; Windows XP-7; Mac OSX - Current

RELATED COURSES

Introduction to Programming, Data Structures, Computer Architecture and Assembly Language, Object-Oriented Programming, Analysis of Algorithms, Database Management, Web Application Development

HONORS

-Siena College Presidential Scholarship

- -Siena College Tech Valley Scholarship (2 recipients per major)
- -Siena College Dean's List (G.P.A. of 3.5-3.9) Spring 2011, Fall 2011, Spring 2013
- -Siena College President's List (G.P.A. of 3.9+) Fall 2010, Fall 2012

-Member of Computer Science Honor Society, Upsilon Pi Epsilon

Permanent Address 120 S. Berkey Dr. Chittenango, NY 13037

Denis Kalic

24 Osborne Road, Albany, New York, 12205 d30kali@siena.edu (518)-788-8506

Education

B.S. Computer Science, May 2014

Siena College, Loudonville, NY, 12211

GPA: 3.60 Computer Science: 3.75

Skills

- Proficiency in Java, Python, and Perl
- Comfortable with C, C++, Shell, HTML/5, CSS/3, PHP, and JavaScript
- GUI and multithreaded programming in Java and Perl
- Familiarity with web application development
- Very comfortable in Unix and Windows development environments

Relevant Experience

Software Engineer Intern, Sixnet, NY

- January 2013 September 2013 • Implemented programmatic firmware loading to a new automation device using Java
- Designed multiple server-side Git plugins in Python that drastically improved detection of firmware build errors and that enforced a strict coding standard
- Assisted in the development of a new Linux firmware programmed in C
- Developed an automated testing infrastructure consisting of over 1000+ test cases in Perl Spring 2012

Software Developer, Siena College

- Created a java applet with a GUI implementation of the board game *Ticket-To-Ride*
- Led 3 other developers through a full development stage from planning and development to testing

Java & Python Tutor, Siena College

- Assisted with teaching object-oriented design and principles to students in group and individual environments
- Helped students with debugging methods for fixing nonworking code
- Taught students best practices and coding styles according to industry accepted standards **May 2011 – September 2011**

Research Assistant, Siena College

- o Programmed an information retrieval module that rated tweets based on social media relevance in Java
- Collaborated with a group in the development of an information retrieval system that returned relevant data from a corpus consisting of 16 million tweets

Accomplishments

- o Presented research at National Institute of Standards and Technology which was published in the paper 10 Weeks to TREC: Siena's Twitter Information Retrieval System
- Designed robot to intelligently play Tic-Tac-Toe against a human opponent implemented in Python
- o Inducted into Upsilon Pi Epsilon an honor society for computing and information disciplines

August 2011 – December 2012

Abigail McCarthy

144 Hidley Rd, Wynantskill, NY 12198 (518) 813-0266 - ak03mcca@siena.edu

Education

Siena College, Loudonville, NY B.S. Computer Science, May 2014 GPA: 3.73

Technical Skills

- Proficient in Java
- Familiar with Python, MIPS Assembly Language, and UML Diagrams

Experience

IT Intern, Pearl Carroll & Associates, Latham, NY

June 2013-Present

September 2010-Present

- Devised a documentation scheme for intra-office computer systems and servers
 - Integrated data models with business practices via Microsoft SharePoint

Circulation Assistant, Standish Library, Loudonville, NY

- Assisted staff and students with locating books and information in the library
- Catalogued and shelved books

Selected Coursework

- Introduction to Programming
- Object Oriented Programming
- Data Structures
- Analysis of Algorithms
- Assembly Language and Computer Architecture
- Computer Graphics
- Database Management
- Computer Ethics
- Designing for the User Experiences
- Artificial Intelligence Research

Activities

Siena College Women in Computing Club

- Panel Presenter, New York Celebration of Women in Computing Conference (Spring 2013)
 - Discussed ideas to get more people interested in computers and sciences
 - Advocated for better support for women within the field

Siena College Women's Rugby Club

Present

- Vice President (January 2013)
 - Organized and managed subcommittees to accomplish club goals
 - Designed and handled team merchandising and equipment orders
- Treasurer (January 2012)
 - Developed annual club budget.
 - Managed and allocated funds for club activities throughout the year

September 2010-

September 2012-Present

Robert Tateo

21 Old Ox Rd, Delmar, NY 12054 (518) 817-7014 rm14tate@siena.edu

Education:

Major: Computer Science BS in Computer Science Siena College, Loudonville, NY Expected graduation December 2014

Relevant Courses:

Java

Intro to Programming Data Structures Object oriented design and programming Communications and Networks

Work experience:

Bethlehem Public Library, Page -Shelve and alphabetize books -Shelve DVD's -Help train new pages

Robotics Project

-Design from ground up project -Implemented code from Google's Willow garage -Created a piano-playing robot.

Systems Administrator

-Systems Administrator Delta Tech in Software Engineering -Maintained an IMac and a windows pc -Troubleshoot any problems for the team.

Languages known:

Proficient in: Java, Python, C++, MySQL Intermediate knowledge in: MIPS, ROS Basic knowledge in: HTML, PHP, CSS, Javascript Operating systems used: Windows 7, OSX, Linux.

Other Accomplishments:

Eagle Scout February 24, 2010.

Other languages Assembly Language and Computer Architecture Database management Web Applications and Development

Theory or Research

Discrete structures Analysis of Algorithms Robotics Software Engineering

August 2011 - present

September 2012- December 2012

September 2013 – Current

Permanent Address

35 Beach Ave.

Albany, NY 12203

Nguyen (Peter) V. Truong

Contact Information

Cell: (518) 417 - 0764 nv03truo@siena.edu

Personal Statement

Fast Learner – Quick to adapt to new environments and to learn the necessary skills to efficiently find the solution

Autonomous – Productive and organized, which leads to an articulate schedule in maintaining and finishing the objective

Result Orientated - Dedication to the project and fulfilling the essential steps in accomplishing its goals

Education

2010 - 2014	Siena College – Loudonville, New York B.S.: Physics, Computational Science, and Computer Science Triple Major; Mathematics Minor GPA: 3.42
Relevant Experience	
Summer 2012 - Current	Research and Development Intern at X-Ray Optical Systems (XOS) Measured liquid and solid samples on High Definition Energy-Dispersive X-Ray Fluorescence (HDXRF) instruments for calibration and analyzed properties of X-Ray interaction with specific certified elements
Summer 2011 – 2012	Undergraduate Physics Research Assistant at Siena College Programmed series of code (Python and MATLAB) to administer incoming data from outside sources for data analysis and presentation for the Terrestrial Gamma Ray Flashes and Auroral GPS Scintillation Project
Spring 2011	Anatomy and Physiology Lab Assistant at Siena College Prepared and coordinated proper procedures in order to facilitate a proficient lab environment handling with dead and organic organisms
Summer 2008 - 2010	Assistant Instructor for Science and Technology Camps at Siena College Reviewed topics such as physics, computer programming, music, and movie editing. Explored Mac application Garageband and worked with Lego Robotics. Primarily instructed kids of the ages 7 – 14
Projects / Leaderships	
Fall 2013	Lead Developer for JPREP (Java Programming Repository & Education Platform) Project at Delta Tech Structured and organized the development of a web-based assignment system that provides a secure platform for students to solve problems and faculty to administer questions accessible through credential logins
Spring 2013	Urban Scholars Minecraft Camp Project Leader at Siena College Managed Science, Technology, Engineering, and Mathematics (STEM) goals for the scholars to accomplish through the usage of Mojang's Minecraft platform. Primarily instructed kids of the ages 7 - 14
2012 - 2014	Vice-President of Siena's Physics and Astronomy Club Led club events that included brown bag research talks, rocket launch competitions, and research symposiums
Summer 2012	Firestation Project at Ad Astra Rocket Company (Houston, Texas) Structured an interface system that would decode Firestation satellite log files and provide with the appropriate results for data analysis through MATLAB for its launch into space
Presentations	
Fall 2012	Summer Research Symposium Presented research on the analysis of consumer products for hazardous toxic elements using X-Ray Fluorescence through the collaboration of Siena Summer Scholar's and X-Ray Optical Systems
Fall 2011	2011 American Geophysical Union Fall Conference (San Francisco, California) Presented research on NASA sponsored Firefly cube-satellite and Firestation upcoming launch information
Computer Skills	

MATLAB, Octave, Mathematica, Java, Python, ROS, JavaScript, HTML, Alice, Microsoft Office, LaTeX, Windows, Linux, Mac OS

Patrick White 6 William Street

Wakefield, MA 01880 (781) 690-6612 pm13whit@siena.edu

OBJECTIVE Seeking a summer intern position to further my skills in programming, analysis, and problem solving in the computer science field.

EDUCATION

Siena College, *Loudonville*, *NY* Bachelor of Science in Computer Science

Minor in Mathematics

September 2010 - May 2014 Major GPA: 3.03

COMPUTER SKILLS

Programming Languages: Java, SQL, HTML, CSS, JavaScript, C++, Python **Software**: Oracle SQL Developer, MS Office, Excel, Powerpoint, Pages, Keynote, Numbers

RELEVANT COURSES

Computer Science: Data Structures; Object Oriented; Database Management; Web Application Development; Analysis of Algorithms; Communications and Networks; Assembly Language and Computer Architecture; Introduction to Artificial Intelligence; Introduction to Computer Science; Introduction to Computer Programming

Mathematics: Calculus I; Calculus II; Calculus III; Discrete Structures I; Discrete Structures II

WORK EXPERIENCE

 Summer Intern, AIG, Boston, MA
 May 2012-August 2012

 Performed a variety of tasks including front end testing of web applications, running SQL queries, and checking logs and error reports of web applications to detect performance issues.

Surveyor, <u>Siena College Research Institute</u>, *Loudonville*, *NY* Requires calling and conducting a variety of surveys to residents of New York. September 2011 - Present

Cashier, <u>The Farm Land</u>, *Wakefield*, *MA* Assisted with managerial duties of the store such as helping customers locate merchandise, resolving complaints, assisting in cashiering, stocking and organizing shelves.

ACTIVITIES

Boy Scouts, Troop 701 Eagle Scout Order of the Arrow member

Siena College Pep Band

Drummer at the Siena College men's and women's Division I basketball games.

Intramural Basketball

September 2010 - Present

September 2010 - Present

September 2006 - Present

HONORS RECEIVED

Dean's List National Honor Society Fall 2012 Semester September 2009 – June 2010