

JavaSpecs

A Web-Based Question & Answer Platform For Formal Behavioral Specifications Of Common Java Libraries

Team May1639:
Client/Advisor:
Project Site:

Arik Coats, Evan Dye, Robert Kloster
Dr. Hridesh Rajan
<http://may1639.sd.ece.iastate.edu/>

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Project Overview

What is JavaSpecs?

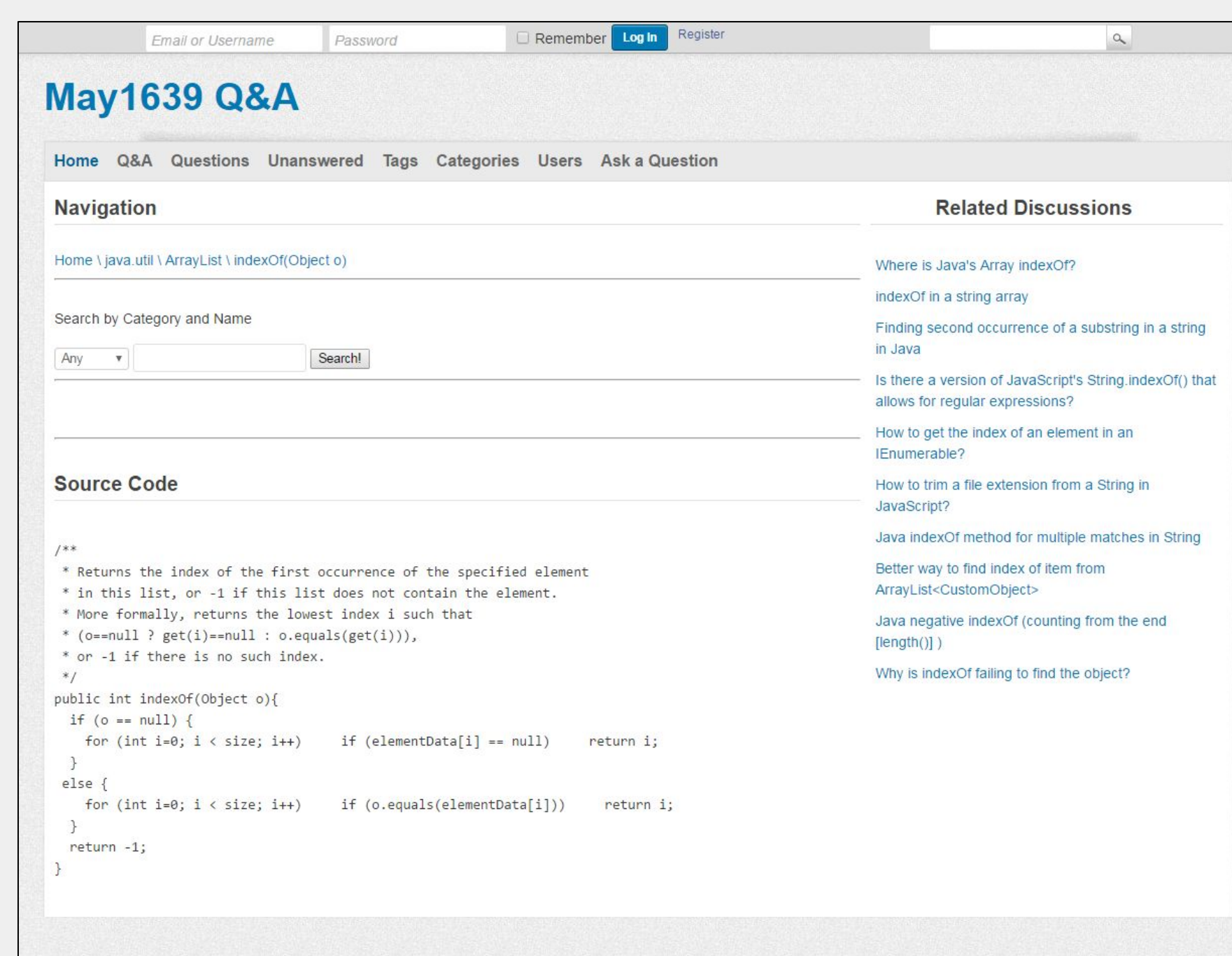
JavaSpecs is a question and answer (Q&A) website dedicated to the creation, discussion, and refinement of formal behavioral specifications for the most commonly used Java libraries.

What are the goals of JavaSpecs?

- Increase the availability, discussion and sharing of knowledge regarding formal specifications
- Reduce the time and effort required to learn about and make use of formal specifications
- Encourage the creation and refinement of formal specifications
- Leverage collective intelligence in order to study specification inference.

Who are JavaSpecs' intended users?

- Programmers seeking information about formal behavioral software specifications.
- Experts in formal behavioral software specifications hoping to add and refine specifications.



Project Requirements

Functional Requirements:

- Allow users to ask and answer questions in a manner similar to Stack Exchange.
- Allow users to navigate supported Java libraries in a Library->Package->Class->Method hierarchy.
- Display source code for all classes and methods.
- Provide a RESTful API to allow external users to retrieve website information.
- Display links to relevant Stack Overflow posts.
- Allow administrators to upload new libraries.

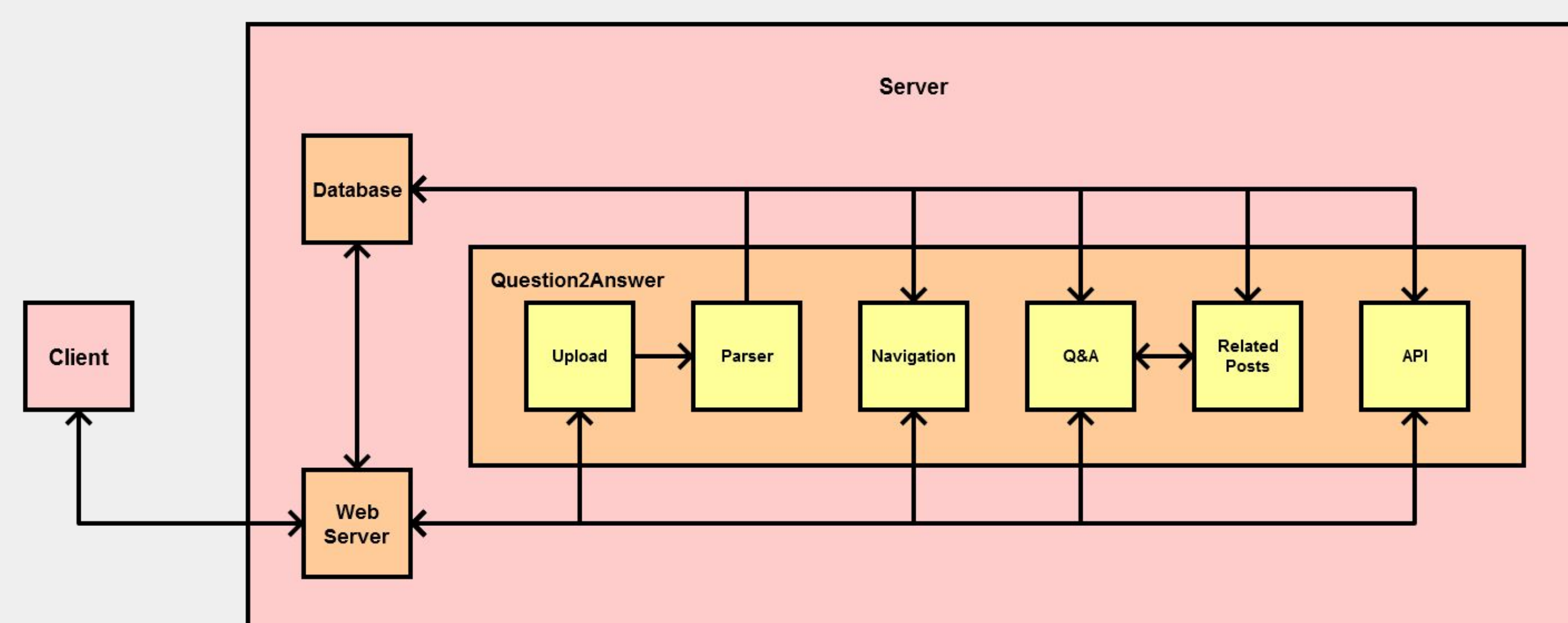
Non-Functional Requirements:

- The website is extensible for future developers.
- Suggested posts from Stack Overflow are both relevant and related to the page a user is viewing.
- The data returned by the API will prove useful in researching specification inference.

Operating Environment

- The forum is built on an installation of Question2Answer 1.7.2, a free Q&A platform.
- The forum is running on a server in a virtual machine provided by Iowa State University Electronics and Technology Group.
- The virtual machine is running a LAMP (**L**inux, **A**pache, **M**ySQL, **P**HP/Python/Perl) stack installation to provide web services.
- The client only needs a modern browser to access the forum.

System Design



- Client (Web Browser)
 - Connects to the web server.
- Web Server (Apache)
 - Connects clients with the server.
- Question2Answer (Forum Software)
 - Upload (AJAX, Javascript, JQuery, PHP)
 - Allows administrative users to upload .zip or .jar files to add additional Java libraries.
 - Navigation (AJAX, Javascript, JQuery, PHP)
 - Provides Library->Package->Class->Method navigation.
 - Displays source code.
 - Parser (Eclipse JDT, Java, JDBC)
 - Parses Java libraries, creating database entries for each method, class, package, and library.
 - Q&A (Question2Answer Forum Software)
 - Provides general Q&A functionality; similar to Stack Exchange sites.
 - Related Posts (AJAX, Javascript, MySQLi, PHP)
 - Provides a list of links to Stack Overflow posts determined to be related to the currently selected method and class.
 - API (MySQLi, PHP)
 - Enables users to submit complex, flexible queries to the database and acquire useful specification research data.
- Database (MySQL)
 - Forum Question/Answer Data
 - Stack Overflow Post Information
 - Java Source Code

Software Technologies

- **Framework:**
 - **Question2Answer 1.7.2**
 - Provides infrastructure for generic Q&A web platform.
- **Languages:**
 - **Java**
 - Parser development language.
 - **Javascript**
 - Client side web programming.
 - **PHP5**
 - Server language.
- **Libraries:**
 - **AJAX**
 - Asynchronous calls to database via PHP scripts.
 - **Eclipse JDT**
 - Provides the core functionality of the parser.
 - **JDBC**
 - Communicates between the parser and database.
 - **JQuery**
 - Forum GUI behavioral programming.
 - **MySQLi**
 - Communicates between the forum and project database.

Project Management/Testing

Project Management

- **GitHub**
 - Collaborative code repository
 - Version control
- **Team Meetings**
 - Tuesday meetings to discuss progress and complete weekly reports.
 - Weekend Development Sessions.
 - Biweekly meetings with advisor/client to receive feedback and new requirements.

Project Testing

- **Isolated Test Driven Development.**
 - Modules built and tested on local systems.
 - Component interface testing
 - White box testing
- **Integration Testing**
 - Tested modules locally in isolation
 - Integration testing when combining modules
 - Regression testing after adding new modules