Review

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Agenda December 1, 2016

- Last class
  - Cloud computing
- Today
  - ETL
  - Semester review
  - Things that we did not cover
- Announcements
  - Survey is currently active; you must have received survey link in email;
  - Assignment 6 is currently active; due on Sunday midnight
  - Final

Final

- Open book, open notes, laptops, e-readers
- No Internet, No IDEs
- Syllabus
  - Comprehensive; everything that we have covered in the class
  - More focus on topics after midterm
- Format
  - Same as midterm
- Date: December 8th
- Time: 7-10 PM
- Location: CLA 0.126

Topics Covered

- HTTP
- Servlets
- Spring framework
- Designing REST APIs
- RESTEasy framework
- Parsing techniques and tools
  - XML, JSoup, SQL
- Logging
- JDBC
- Hibernate
- Testing
  - Unit testing
  - Functional testing
- ETL
- JavaScript
- Cloud computing

HTTP Headers

- What is the purpose of “If-None-Match” request header?

- What is the purpose of the “Location” response header?

Servlets

- What is the difference between ServletContext object and ServletConfig object?
- In the Spring setup, the web.xml only contained definition of the DispatcherServlet. What is the purpose of this Servlet?

REST API

- What is the addressability property in REST?
  - Did we use it in our assignments?
    - If yes, explain how?

- Design REST API for a given problem definition
  - Identify the resources and methods on them
  - Show resource representation

REST

- Suppose we wanted to support a “bulk create” operation in our REST API. A bulk create is an operation which allows creation of more than one resource. What issues would we need to solve for?

- Consider a GET call that generates a large response. Typically such a response would be shown to the user in parts, using the notion of “pages”. Each response page contains a link to the next page. Which underlying REST principle is coming into play in modeling the next page links?

Databases

- Design data-model for a given problem definition
  - Identify the tables and the columns
  - Use the data model to show how to answer given queries (Use SQL)
- Write a query using JDBC to insert a row in a database
- Write a query using Hibernate to retrieve a row that satisfies a particular query condition

Functional Testing

- What is the difference between functional testing and unit testing?
- How would you write functional tests for assignment 6?

JavaScript

- What is the event bubbling model of JavaScript?

- Given a JavaScript code snippet indicate what will be the output of clicking on a particular element?

Same Origin Policy

- What is the same origin policy
- Identify whether the specified resources have the same origin?

- http://stackoverflow.com/questions/929677/how-exactly-is-the-same-domain-policy-enforced

Cloud Computing

- Consider the PaaS model of cloud computing. What are some of the issues that such a model needs to address to allow users to seamlessly deploy their applications on the platform

Languages/frameworks/libraries

- Python
  - Django, Flask
- Ruby
  - Rails
- Java
  - Groovy, Scala
- PHP
- C#
- JavaScript
  - AngularJS, ReactJS, Bootstrap, JQuery

Topics not covered

Topics

- Non-relational (NoSQL) systems
- Linux Containers
- Configuration Management
- Continuous Integration
- Continuous Deployment
- CI/CD
- More Testing
  - Performance testing
  - User interface testing
  - Behavior Driven Development

Non-relational (NoSQL) Systems

- We have learnt about relational databases like MySQL
- There are applications that don’t need relational systems
- NoSQL systems provide ability to store data in non-relational manner. Examples:
  - MongoDB
  - Cassandra
  - CouchDB

Linux Containers

- LXC
  - https://linuxcontainers.org/
- Docker
  - https://www.docker.com/
- Rocket by CoreOS
  - https://coreos.com/blog/rocket/

Configuration Management

- What is it?
  - Configure server with required packages
    - E.g.: Automate ‘apt-get install’ commands
- Popular tools
  - Chef
  - Puppet
  - Ansible
  - Salt

Continuous Integration

- Whenever new code is submitted, run the tests and merge it into master branch only if tests pass
  - Invariant to maintain: Master branch should never be broken
- Tools
  - A CI Server
    - Jenkins
  - Mechanism(s) to trigger running of tests
  - Mechanism(s) to report the results

Continuous Deployment

- Deploy tested code to deployment seamlessly

- CI/CD
  - Continuous integration; continuous delivery/deployment

Testing

- Performance testing
- User interface testing

- Behavior Driven Development

Industry Jobs

- Software Developer/Engineer
- Quality Engineer/Test Engineer
- Software Architect/Solution Architect/Enterprise Architect
- Operations Engineer/Systems Engineer/DevOps Engineer
- System Administrator
- Support Engineer
- Designer
- Business Analyst
- Project Manager
- Product Manager
- Development/Delivery Manager
- Documentation writer

Sample team composition

- Software Engineers: 4
- Quality Engineers: 2 or 3
- Architect: 0 or 1
- Operations Engineer: 1
- Business Analyst: 0 or 1
- Product Manager: 1
- Development Manager: 1
- Project Manager: 0 or 1

Important skills

- Communication
  - Ask questions and provide thoughtful answers in discussions/debates, or during white-boarding sessions
- Team work
  - Ability to work well with others
- Good grasp of fundamental computer science concepts
  - A must for software engineer, quality engineer, and operations engineer roles

Thanks!!

- Thanks for a great semester
  - I enjoyed being here with you all
  - Hope you enjoyed as well :)

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