ITMD 415/515
Advanced Software Development

Week 3 – JDBC and Bean Validation

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Administrative Stuff

- Canvas Discussions
- Adds/Drops

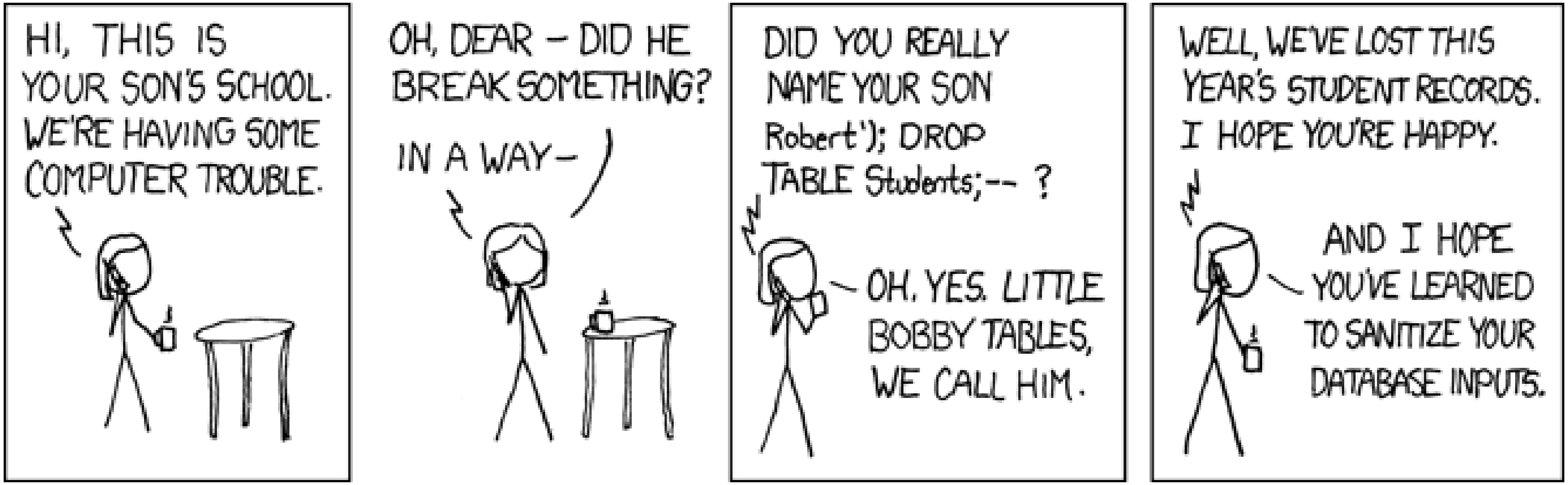
JDBC Basics

- Slides From Oracle
  - Connection
  - Statement
  - ResultSet

PreparedStatement

- Situation
  - You are repeatedly executing query or update where format stays consistent, but values change
  - You can make a parameterized query or update, then pass in values for the placeholders
- Advantages
  - More convenient than string concatenation
  - Significantly faster with most drivers and databases
  - If values contain user data, much less susceptible to SQL injection attacks

SQL Injection


HI, THIS IS YOUR SON'S SCHOOL. WE'RE HAVING SOME COMPUTER TROUBLE.
OH, DEAR – DID HE BREAK SOMETHING?
IN A WAY–
DID YOU REALLY NAME YOUR SON Robert'); DROP TABLE Students;-- ?
OH. YES. LITTLE BOBBY TABLES, WE CALL HIM.
WELL, WE'VE LOST THIS YEAR'S STUDENT RECORDS. I HOPE YOU'RE HAPPY.
AND I HOPE YOU'VE LEARNED TO SANITIZE YOUR DATABASE INPUTS.

(from Randall Munroe and xkcd.com)

Bean Validation

- Bean Validation 1.1 in Java EE 7
- Bean Validation 2.0 in Jakarta EE 8+
- javax.validation package
- Hibernate Validator
  - Custom Validation in all layers vs Standard Validation in Domain Model

Getting Starting with Bean Validation

- http://hibernate.org/validator/documentation/getting-started/
  - Maven Coordinates
  - Junit
    - Where to place Validator?
    - Jakarta EE API Docs

Built-In Constraints – 1.1

Constraint	Accepted Types	Description
AssertFalse AssertTrue	Boolean, boolean	The annotated element must be either false or true
DecimalMax DecimalMin	BigDecimal, BigInteger, CharSequence, byte, short, int, long, and respective wrappers	The element must be greater or lower than the specified value
Future Past	Calendar, Date	The annotated element must be a date in the future or in the past
Max Min	BigDecimal, BigInteger, byte, short, int, long, and their wrappers	The element must be greater or lower than the specified value
Null NotNull	Object	The annotated element must be null or not
Pattern	CharSequence	The element must match the specified regular expression
Digits	BigDecimal, BigInteger, CharSequence, byte, short, int, long, and respective wrappers	The annotated element must be a number within accepted range
Size	Object[], CharSequence, Collection<?>, Map<?, ?>	The element size must be between the specified boundaries

New Constraints – 2.0

Constraint	Accepted Types	Description
Email	CharSequence	Checks whether the specified character sequence is a valid email address
NotEmpty	CharSequence, Collection, Map and arrays	Checks whether the annotated element is not null nor empty
NotBlank	CharSequence	Checks that the annotated character sequence is not null and the trimmed length is greater than 0. The difference to @NotEmpty is that this constraint can only be applied on character sequences and that trailing white-spaces are ignored.
Positive Negative	BigDecimal, BigInteger, byte, short, int, long and the respective wrappers of the primitive types	Checks if the element is strictly positive/negative. Zero values are considered invalid.
PositiveOrZero NegativeOrZero	BigDecimal, BigInteger, byte, short, int, long and the respective wrappers of the primitive types	Checks if the element is positive/negative or zero.
PastOrPresent FutureOrPresent	java.util.Date, java.util.Calendar, java.time.*	Checks whether the annotated date is in the present or in the past/future.

Testing and Maven

- Maven
  - https://maven.apache.org/guides/introduction/introduction-to-the-lifecycle.html#Build_Lifecycle_Basics
- Testing
  - https://junit.org/junit5/docs/current/user-guide/#writing-tests
  - Annotations
  - Test Classes and Methods
  - Assertions

Sources Used

- The Jakarta EE Tutorial. Retrieved Aug 24, 2020, from https://eclipse-ee4j.github.io/jakartaee-tutorial/toc.html
- Juneau, J. (2020). Jakarta EE 8 Recipes. New York, NY: Apress.
- Goncalves, A. (2013). Beginning Java EE 7. New York, NY: Apress.
- Some slides adapted with permission from Marty Hall (www.coreservlets.com – JSP and Servlets)