CSCI 3901: Project final document for testing.

Test cases:

getConnection()

Input Validation:

- Check if the connection URL is valid
- Check if the username and password are valid
- Check if the database exists

Boundary Cases:

- Handle SQLException if the connection cannot be established

Data Flow Cases:

- Connection is established with the database
- The database is switched to the specified schema

Control Flow Cases:

- Successful connection establishment
- Connection failure

addPublication()

Input Validation:

- Check if the publicationInformation map has valid keys and values
- Check if the identifier is not null and not empty
- Validate the year and venueId are valid integers

Boundary Cases:

- SQLException handling
- Publication information map is empty

Data Flow Cases:

- Insert a new publication record into the database

Control Flow Cases:

- Successful insertion of publication
- Insertion failure

addAuthor()

Input Validation:

- Check if the identifier and fullName are not null and not empty

Boundary Cases:

- SQLException handling

Data Flow Cases:

- Insert a new author record into the database

Control Flow Cases:

- Successful insertion of author
- Insertion failure

addPublicationAuthor()

Input Validation:

- Validate publicationId and authorId are valid integers

Boundary Cases:

- SQLException handling

Data Flow Cases:

- Insert a new publication-author record into the database

Control Flow Cases:

- Successful insertion of publication-author
- Insertion failure

addReferences()

Input Validation:

- Check if the references Set has valid values
- Check if the identifier is not null and not empty

Boundary Cases:

- SQLException handling
- References set is empty

Data Flow Cases:

- Insert a new reference record into the database for each reference

- Successful insertion of references
- Insertion failure

addVenue()

Input Validation:

- Check if venueName is not null and not empty
- Check if venueInformation map has valid keys and values
- Validate publisherId and conference_year are valid integers
- Check if researchAreas HashSet has valid values

Boundary Cases:

- SQLException handling
- Venue information map is empty

Data Flow Cases:

- Check if publisher_id exists in the Publisher table
- Insert a new venue record into the database

Control Flow Cases:

- Successful insertion of venue
- Insertion failure

addPublisher()

Input Validation:

- Check if identifier is not null and not empty
- Check if publisherInformation map has valid keys and values

Boundary Cases:

- SQLException handling
- Publisher information map is empty

Data Flow Cases:

- Insert a new publisher record into the database

Control Flow Cases:

- Successful insertion of publisher
- Insertion failure

addArea()

Input Validation:

- Check if researchArea is not null and not empty
- Check if parentArea Set has valid values

Boundary Cases:

- SQLException handling
- Parent area set is empty

Data Flow Cases:

- Insert a new research_area record into the database for each parent area

Control Flow Cases:

- Successful insertion of research areas
- Insertion failure

getPublications()

Input Validation:

- key is null or empty
- key has leading/trailing whitespaces

Boundary Cases:

- Publication with the given key does not exist
- Publication with the given key exists

Data Flow Cases:

- Properly formatted SQL query
- Properly setting the PreparedStatement
- Properly returning the ResultSet

Control Flow Cases:

- Catching SQLException

authorCitations()

Input Validation:

- author is null or empty
- author has leading/trailing whitespaces

Boundary Cases:

- Author with the given name does not exist

- Author with the given name exists but has no citations
- Author with the given name exists and has citations

Data Flow Cases:

- Properly formatted SQL query
- Properly setting the PreparedStatement
- Properly returning the ResultSet

Control Flow Cases:

- Catching SQLException

seminalPapers()

Input Validation:

- area is null or empty
- area has leading/trailing whitespaces
- paperCitation is negative
- otherCitations is negative

Boundary Cases:

- Research area with the given name does not exist
- Research area with the given name exists but has no seminal papers
- Research area with the given name exists and has seminal papers

Data Flow Cases:

- Properly formatted SQL query
- Properly setting the PreparedStatement
- Properly returning the ResultSet

Control Flow Cases:

- Catching SQLException

collaborators()

Input Validation:

- author is null or empty
- author has leading/trailing whitespaces
- distance is negative

Boundary Cases:

- Author with the given name does not exist
- Author with the given name exists but has no collaborators
- Author with the given name exists and has collaborators

- Properly formatted SQL query
- Properly setting the PreparedStatement
- Properly returning the ResultSet

Control Flow Cases:

- Catching SQLException

authorResearchAreas()

Input Validation:

- authorName is null or empty
- authorName has leading/trailing whitespaces
- threshold is negative

Boundary Cases:

- Author with the given name does not exist
- Author with the given name exists but has no research areas
- Author with the given name exists and has research areas

Data Flow Cases:

- Properly formatted SQL query
- Properly setting the PreparedStatement
- Properly returning the ResultSet

Control Flow Cases:

- Catching SQLException

addParentAreas()

Input Validation:

- areaName is null or empty
- areaName has leading/trailing whitespaces

Boundary Cases:

- Research area with the given name does not exist
- Research area with the given name exists but has no parent areas
- Research area with the given name exists and has parent areas

Data Flow Cases:

- Properly formatted SQL query
- Properly setting the PreparedStatement
- Properly returning the ResultSet

- Catching SQLException

PaperConversion constructor()

Input validation:

- Check if the provided URL, user, and password are not null or empty strings. Boundary cases:
- Invalid database URL.
- Incorrect user or password.
- Connection issues with the database.

getAbbreviatedAuthors()

Input validation:

- Check if the provided list of authors is not null and not empty.

Boundary cases:

- Single author in the list.
- An author name with only one part (e.g., "Madonna").

Data flow cases:

- Names containing special characters or numbers.

getIEEEReference()

Input validation:

- Check if the provided key is not null and not an empty string.

Boundary cases:

- Citation key not found in the database.

Data flow cases:

- Publications with missing or incomplete data.

Control flow cases:

- Handling null values when the citation key is not found.

replaceCitations()

Input validation:

- Check if the provided text and citationMap are not null and not empty.

- No citation commands found in the text.

Data flow cases:

- Citation commands with different formats (e.g., multiple spaces or line breaks).

Control flow cases:

- Iterating through the citationMap and replacing all occurrences of citation keys.

main ()

Input validation:

- Check if the provided inputFile and outputFile are not null and not empty strings.

Boundary cases:

- Input file not found or not readable.
- Output file not writable.

Data flow cases:

- Text files with different encodings.

Control flow cases:

- Writing the output file after processing the input file.

main (static method)

Input validation:

- None (input is taken from the user via the console).

Boundary cases:

- Incorrect or invalid input and output file paths.

Data flow cases:

- User input with different encodings or special characters.

Control flow cases:

- Handling SQLException and IOException when calling the non-static main method.