Project Milestone Documentation

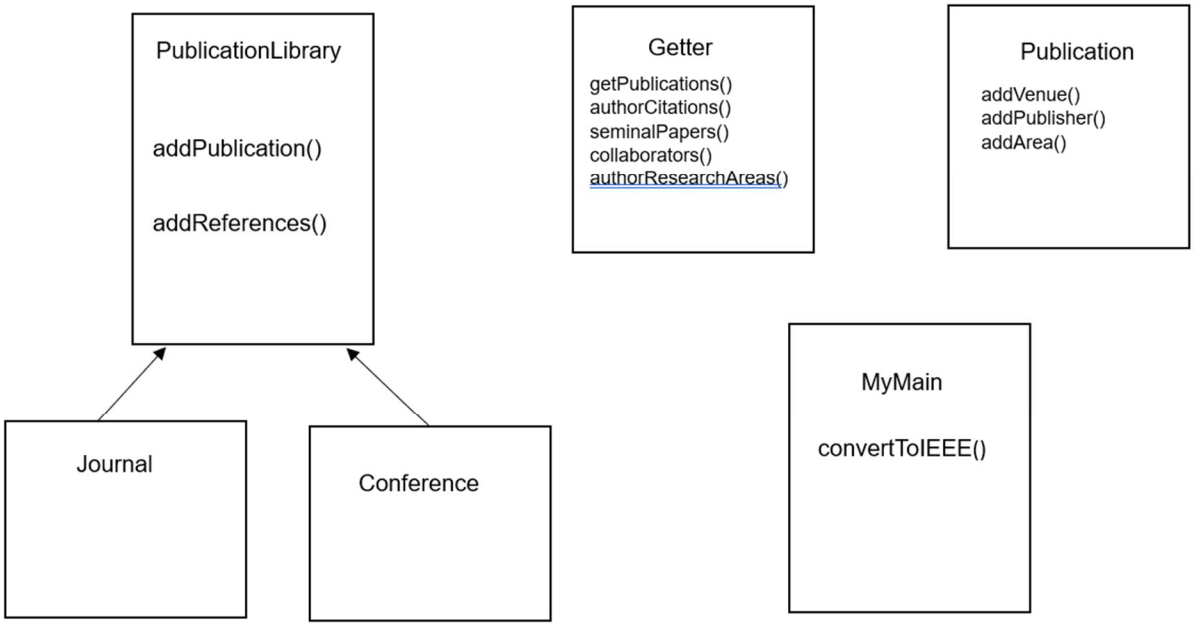
Code Design

The PublicationLibrary will be an interface having all the setter methods(addPublication(), addReferences()). This interface will be implemented by the Journal and Conference classes.

For the getter methods (getPublications(),authorCitations(),seminalPapers(),collaborators(),authorResearchAreas()) ,I will have a separate class.

Then a separate class will be there to handle all the information related to a publication (addVenue(),addPublisher(),addArea()).

There will be a separate main class that will consist of the method that transforms the citations into IEEE references and creates connection with the database.



Data Structures

Since the information should survive between the execution of the programs, I will be storing the data into the database.

Data for a Journal will be stored in the table called Journal. Similarly, for the conferences. Reference will be added in the References table with identifier as the common key between the Journal/Conference and References table. The publisher information will be added to the table Publisher with identifier as the common key.

Information regarding publication venue will be stored in a table called Venue and similarly information for research area in a table called Research Area.

For the getter methods, the data will be stored in the data structure of their respective return type.

The internal data structure that will be used will be the Map and Set as these are the return types and the arguments type for the methods.

Key Algorithms

- *For storing the information*: The program will get all the information from the respective setter method and using an insert operation add the row in the respective tables.
- *For retrieving the information*: The program will fetch the data using a select statement and then store it in the Set or Map as per the return value of the getter method.

Blackbox Tests

For boolean addPublication (String identifier, Map<String, String> publicationInformation)

Input validation

- Identifier is not alphanumeric
- Identifier is null and publicInformation is empty
- Identifier is null and publicInformation is not empty
- Identifier is not null and publicInformation is empty
- Identifier is not null and publicInformation is not empty
- Identifier is a repeated
- publicationInformation has null values for some of the keys

Data Flow

- Publication is added before adding the publisher, venue or research area

For boolean addReferences (String identifier, Set<String > references)

Input validation

- identifier does not exists in the publicationLIbrary
- identifier is not alphanumeric
- Identifier is null and references is empty
- Identifier is null and references is not empty
- Identifier is not null and references is empty
- Identifier is not null and references is not empty

Data Flow

- References are added before adding the publisher, venue, research area or publication

For boolean addVenue (String venueName, Map<String, String> venueInformation, Set<String>researchAreas)

Input validation

- venueName is null or empty
- venueInformation is empty
- researchAreas is empty

DataFlow

- Venue is added before publisher, venue or research area
- Venue is added after publication or references are added

For boolean addPublisher (String identifier, Map<String, String> publisherInformation)

Input validation

- Identifier is null and publisherInformation is empty
- Identifier is null and publisherInformation is not empty
- Identifier is not null and publisherInformation is empty
- Identifier is not null and publisherInformation is not empty
- identifier is not alphanumeric

Data Flow

- Publisher is added after venue, publication or references is added
- Publisher is added before research area is added

For boolean addArea (String researchArea, Set<String> parentArea)

Input validation

- parentArea is null
- researchArea is null
- researchArea is not null but parentArea is empty
- researchArea is not null and parentArea is not empty but reasearchArea is not a subset of parentArea

Data Flow

- Research area is added before adding publisher, venue, publication or references.

For Map<String, String> getPublications (String key)

Input validation

- key is null
- key is empty
- the key does not exist

Data Flow

- *Method is called before adding that particular publication*

For int authorCitations (String author)

Input validation

- author is null
- author is an empty string
- author does not exist
- there are multiple authors with same name
- author has been cited multiple times by the same publication.

Data Flow

- method is called before adding the publications of that use that author's publications

For Set<String> seminalPapers (String area, int paperCitation, int otherCitations)

Input validation

- area is null
- area is empty string
- area does not exist

Boundary cases

- paperCitiation is 0
- otherCitations is 0
- paperCitation and otherCitations are both more than the total number of papers in the given area

Data Flow

- method is called before adding the publication and the references

For Set<String> collaborators(String author, int distance)

Input validation

- author is null
- author is empty string
- author does not exist

Boundary cases

- author has no collaborators or distance is 0
- has collaborators but they are not in the given distance

Data Flow

- method is called before the publication is added and references are added

For Set<String> authorResearchAreas (String author, int threshold)

Input validation

- author is null
- author is empty string
- author does not exist

Input validation

- threshold is 0
- threshold is more than the total number of papers published by the author

Data Flow

- method is called before the research areas are added and publications are added

For main() method

Boundary condition/Input Validation

- input file does not exist
- output file does not exist