CHAPTER IX

CONCLUSION

The major findings and contributions of this research work and the potential directions for further research works are summarized in this chapter.

A comprehensive understanding of ontology mediation is achieved through a literature survey and a competitive analysis. This leads to the various research aspects specific to the roles on ontology mediation.

Algorithms for matching and merging of ontologies using directed graphs are developed and the theoretical aspects are discussed in detail.

Ontology operations such as ontology merging, ontology difference and ontology matching using Ontology Abstract Machine are demonstrated using examples from health care domain.

The research work has proposed a framework for ontology matching and merging. The framework is validated by an innovative approach for developing Ontology based Question Bank System. Although other approaches have been discussed in the literature, the approach presented in this work is based on domain Ontologies. It identifies important concepts and generates multiple choice questions about these concepts along with the distracters. Each Question Bank consists of sets of test items each of which consists of a question or stem. An ontological system integrated with an educational platform can support teachers in building effective question bank system and students are tested using generated questions. To this end the researcher has proposed an ontological approach to semantically enrich question bank generation. In particular the association of semantics to the question bank system can greatly improve their organization and management, both for students and teachers. The java ontology developed in this research work is used as a domain ontology for the implementation of the Ontology based Question Bank System.

An approach to the practical ontology development is discussed in detail and presented the designed ontology for teaching Java programming. The described approach can be applied for developing learning ontologies where general understanding is more
important than factual details. Further the effectiveness of the learning process with the use of *java ontology* is justified with an experiment conducted in a classroom situation.

**9.1. Further works and Directions**

The union and difference operations for finite automata do not consider the semantic characteristics of ontologies. For example, Nurse could be a Registration_staff or the two terms can be synonyms and the operations do not provide the correct result since they just compare mode labels. The language generated by the Ontology Abstract Machines can also be explored by introducing the final state.

The Ontology based Question Bank System can be extended in several perspectives as:

(i) More Components can be added such as axioms to the domain ontology used in the framework.

(ii) The question bank generated can accommodate only Multiple Choice Questions. It can be further generalized to include other objective type of questions like Multiple Response, True/False, Multiple Hotspots, Sequence, Numbering, Text Match, Selection/Association and Assertion/Reason.

(iii) Class-based Strategies, Property-based Strategies and Terminology-based Strategies can be included in the generation of distracters.

The *java ontology* developed for learning a programming language can be further extended by adding Semantic Web Rule Language. Further it can be also included as a component in any learning management system.