A PROJECT REPORT

ON

"INTELLIGENT PROGRAMMING LEARNING SYSTEM BASED ON ARTIFICIAL INTELLIGENCE"

Submitted in the partial fulfillment of the requirements for

The degree of

BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING

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UNDER THE GUIDANCE OF

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University of Mumbai

2017-18

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DECLARATION

I declare that this written submission represents my ideas in my own words and where others ideas or words have been included. I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Ankur Yadav

Anjali Sharma

Lokeshwari Bonthu

Date:

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After the completion of this work, words are not enough to express feelings about all those who helped us to reach goal.

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ANKUR YADAV

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ABSTRACT

The project is based on artificial intelligence concepts. There are plenty of options available outside to learn programming. There are concepts given and one can study them. But what if any question arises in his/her mind and he want to ask it. The person needs to find some blog or some other platform where he can ask his/her question.

In this project we will be implementing Artificial Intelligence that will be able to understand the question asked by the user, analyze it, and try to generate an answer using its database. If it cannot generate the answer then it will also be able to ask the same question to the expert system that will be some another person who is really expert in that programming language. This will create a community in programming world which will be able to make them communicate in real time.

The actual motive behind this project is to make a teaching learning process more convenient for students who want to personalize their programming skills. This will provide a student to learn anytime, anywhere and without any hesitation students can get answers to any question the want to ask.

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INTRODUCTION

1.1. GENERAL:

E-Learning is the employment of technology to aid and enhance learning. It can be as simple as High School students watching a video documentary in class or as complex as an entire university course provided online. e-Learning began decades ago with the introduction of televisions and over-head projectors in classrooms and has advanced to include interactive computer programmers, 3D simulations, video and telephone conferencing and real-time online discussion groups comprised of students from all over the world. As technology advances, so does e-learning, making the possibilities endless.

Artificial Intelligence is a way of **making a computer, a computer-controlled robot, or a software think intelligently**, in the similar manner the intelligent humans think. AI is accomplished by studying how human brain thinks, and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as a basis of developing intelligent software and systems [12].

The application of AI to e-Learning content is not just a cost-saving solution; it also opens up a whole new way of looking at learning itself [12]. People learn in different ways and at different paces, so one of the major challenges in classrooms is maintaining a balance between engaging the quicker learners and accommodating the slower ones. In this type of situation, adaptive learning environments can allow for a completely individualized pace. This includes environments that can accommodate individual learning styles and can run in parallel to each other. Thus, creating a far more effective learning environment, and increasing the chances of a group of individuals assimilating information accurately over a set period of time.

NLP is a way for computers to analyze, understand, and derive meaning from human language in a smart and useful way. By utilizing NLP, developers can organize and structure knowledge to perform tasks such as automatic summarization, translation, named entity recognition, relationship extraction, sentiment analysis, speech recognition, and topic segmentation. NLP is characterized as a hard problem in computer science. Human language is rarely precise, or plainly spoken [8]. To understand human language is to understand not only the words, but the concepts and how they're linked together to create meaning. Despite language being one of the easiest things for humans to learn, the ambiguity of language is what makes natural language processing a difficult problem for computers to master.

Natural language processing involves the reading and understanding of spoken or written language through the medium of a computer. This includes, for example, the automatic translation of one language into another, but also spoken word recognition, or the automatic answering of questions. Computers often have trouble understanding such tasks, because they usually try to understand the meaning of each individual word, rather than the sentence or phrase as a whole. So for a translation program, it can be difficult to understand the linguistic nuance in the word 'Greek' when it comes to the examples 'My wife is Greek' and 'It's all Greek to me', for example [8].

Through natural language processing, computers learn to accurately manage and apply overall linguistic meaning to text excerpts like phrases or sentences. But this isn't just useful for translation or customer service chat bots: computers can also use it to process spoken commands or even generate audible responses that can be used in communication with the blind, for example. Summarizing long texts or targeting and extracting specific keywords and information within a large body of text also requires a deeper understanding of linguistic syntax than computers had previously been able to achieve.

- The term **morphology** is concerned with the interplay between words and their relationship with other words
- **Syntax** defines how words and sentences are put together [8]
- **Semantics** is the study of the meaning of words and groups of words
- **Pragmatics** is used to explain the content of spoken expressions

- And lastly, **phonology** covers the acoustic structure of spoken language and is essential for language recognition

1.2. OBJECTIVE AND PROBLEM STATEMENT :

The Intelligent Programming Learning System is based on artificial intelligence concepts. In traditional way of learning system where teacher teaches the student. In this it might happen that the student is not focused or there is fee which is not affordable for some students. This leads to loss of knowledge. So to overcome the traditional way of learning, traditional classroom learning is being joined by online learning.

In online learning, if a student wants to learn any languages then they have to go through the surfing and searching in the internet. This is time consuming and there is no guarantee that student will get the proper answer for a particular questions.

There are plenty of options available outside to learn programming. There are concepts given and one can study them. But what if any question arises in his/her mind and he/she wants to ask it. The person need to find some blog or some other platform where he can ask his/her question and they may get or not get the answer about the question which leads to lots of time and hard work waste.

The above stated project is to make an efficient system which will understand the need of users. If a person wants to learn in night he may not get the traditional classes and online searching waste a lots of time. If users get a question but they might not get the answer about it, so to overcome that we are creating a software which will provide all related information about the particular language. If he/she wants to learn he can use the project as there are many facilities will be provided to a user.

In this project we will be implementing Artificial Intelligence that will give all knowledge related to the particular language. If a person need to ask a question then he will enter the question either by speech or by text input, then NLP logic understand the question asked by the user, analyze it, parse the sentence using Regular Expression Grammar, and try to generate an answer using database. If answer is in database it will reply at the same time.

If it cannot generate the answer then it will ask the same question to the expert system that will be some another person who is really expert in that programming language. This expert system will be developed as an android application which will be installed on expert's mobile device. From this application, expert can answer all the questions that couldn't be answered by program using NLP.

The main advantage of this project is a person will be able to learn the language he/she is most interested in. He/she can study at their flexible time as the system will store all the information he/she doesn't need to be online all the time he/she can study offline.

Another advantage of this project is it will start interconnecting the users across globe. This will create a community in programming world which will be able to make them communicate in real time.

This software will be portable as it will stored in raspberry pi he/she doesn't need to carry a laptop to study this and by choosing the subject he/she is interested in the user will be self-discipline and responsible about it.

Chapter 2

LITRETURE REVIEW

Traditional Classroom learning is nowadays being joined by online learning. As there are some advantages of learning in classrooms, also there are some advantages of learning online. Following are some advantages of learning online or self-learning which have been observed in many students in few past years [12].

1. **Career advancement and hobbies**

Studying online gives you more flexibility. You can work and fit your work schedule (and your hobbies) around your coursework more easily; even more so if you are taking an asynchronous class: an online class where you don't have to log in at a specific time for a live session but you can study and interact with your instructor and your fellow classmates at your own pace through, for example, the discussion forum [12].

In a survey conducted by The Learning House, 44% of online students reported improvements in their employment standing, for example by obtaining a full-time job within 12 months of graduation, and 45% reported a salary increase

2. **Flexible schedule and environment**

By studying online, you choose your own learning environment that works best for your needs: be it your bedroom, your study, the café across the street, or your local gym, listening to your instructors lecture pod-cast as you run on the treadmill. Isn't that awesome?

Taking an online course also means that you don't have to com-mute to class, which means less time spent on the bus and more study time sitting on your couch, the sound of a crackling fireplace

in the background. You no longer have to worry about driving in the snowstorm and missing an important class!

3. **Lower costs and debts**

Studying online means that you pay the tuition fee, possibly book supplies, an online application fee, and few other items. You don't, however, incur the costs of housing (which can range from $10,000 to $12,000 per year) and transportation, which translates to lower debts and more savings.

4. **Self-discipline and responsibility**

Who says that having to be more self-disciplined is a disadvantages? It is true that studying online requires more self-motivation and time-management skills, because you will spend a lot of time on your own without someone physically close to keep you focused on deadlines. Look at it this way: your online course will not only teach you geology or poetry, it will also help you become more self-motivated, a trait that will make you stand out in the workplace and beyond. It will look great on your resume.

5. **More choice of course topics**

Let's face it, when thinking about what to study, besides for interest and career opportunities, where to study is also a deciding factor. This may limit the choice of subjects or courses to take. Studying online at your own convenience allows you to no longer worry about class location when choosing what to learn next. By taking an online course, you can really focus on the subject you are interested in and choose from the variety of online courses and programs.

With the advantages, there are some disadvantages that comes with online learning.

1. It may be hard to express your thoughts, feelings or opinions in writing
2. Emails, discussion board posts, and chats may be misunderstood be-cause there are no visual cues to your the senders intentions.
3. Lots of reading from the lecture, to textbooks, to discussion board posts which you must read and respond to, you have to be sure not to miss vital information [12].
4. It is difficult to form a real connection with your peer.

Now this is how our learning system takes over the disadvantages of online learning system and makes it a perfect smart learning solution:

- One will be able to ask any question that he/she may feel to ask.
- There will always be live expert system who will be there to answer the question asked by student.
- There will be no need to read a lot as it will be both textual and audio learning system which will be completely able to interact with help of speech.

Why to go for Raspberry Pi over other boards like Arduino [11].

An Arduino is a microcontroller motherboard. A microcontroller is a simple computer that can run one program at a time, over and over again. It is very easy to use.

A Raspberry Pi is a general-purpose computer, usually with a Linux operating system, and the ability to run multiple programs. It is more complicated to use than an Arduino.

1. An Arduino board is best used for simple repetitive tasks: opening and closing a garage door, reading the outside temperature and re-porting it to Twitter, driving a simple robot [11].

2. Raspberry Pi is best used when you need a full-fledged computer: driving a more complicated robot, performing multiple tasks, doing intense calculations

3. Raspberry Pi is fully customizable computer, and whatever configuration we have can be used fully to run a single program that we want to run which will increase the efficiency of the program.

4. Raspberry Pi system is and open source system that will cost nothing for development, mostly development in Raspberry Pi is done using Python which has huge community and scope in future.

Why to go for Mongo DB over MySQL of other RDBMS [10]:

1. Schema-less design enables rapid introduction of new CDR types to the system. It let Bill Run keep the data store generic [10].
2. Scale Bill Run production site already manages several TB in a single table, w/o being limited by adding new fields or being limited by growth
3. Rapid replica Set enables meeting regulation with easy to setup multi data center DRP and HA solution.
4. Sharing enables linear and scale out growth w/o running out of budget.
5. Developer oriented queries, enable developers write a elegant queries.
6. Location based is being utilized to analyze user's usage and deter-mining where to invest in cellular infrastructure.

Chapter 3

METHODOLOGY

3.1. ALGORITHMIC DETAIL:

In Contemporary world, life styles and interactions have changed in all applications domain due to increasing advances of internet technology [9]. Due to recent advances in information explosion, tries to build an intelligent question answering system where user may communicate with a machine in natural language to get response to user question using different strategies like Natural Language Processing (NLP), Artificial Intelligence, Information Retrieval and Human Computer Interaction. Natural Language Processing is a technique where computer behave like human, which helps people to talk to the computer in their own language rather than computer commands [9]. The skills needed to build intelligent answering system includes tokenization, parsing, parts of speech tagging, question classification, query construction, sentence understanding, document retrieval, keyword ranking, classifier, answer extraction and validation. The current study intends to develop an intelligent system for user queries in natural language for precise answer.

The interaction between human being and computer is always an interesting and challenging task. Understanding the natural language questions correctly and providing exact response is a challenging task for existing QA systems. NLP aims to develop a computer program which analyzes syntactically natural human language. The main goal of NLP is to fill the gap how human communicate in natural language and what the computer understands in machine language. Generally there are two types of QA systems [8]. Closed domain question answering system deals with questions under a specific domain and open domain question answering system deals with all

domains. In closed domain system answers to questions cannot be searched using search engines, so domain expert maintained a database using template matching.

Figure 3.1.1 show QA methods for intelligent answering system which combines strategies from Natural Language Processing, Artificial Intelligence, Information Retrieval, Information extraction and human computer interaction [9].

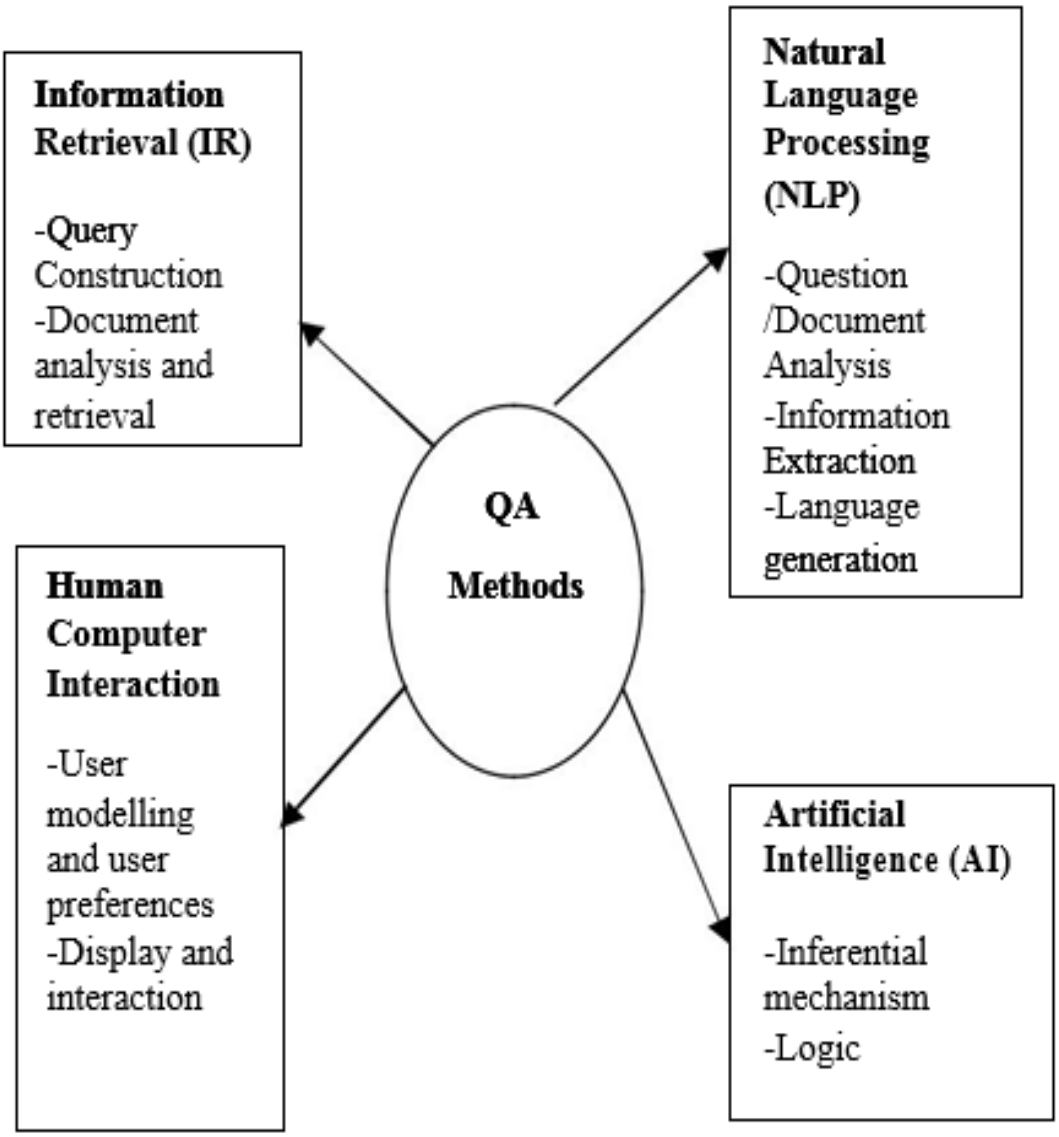

Figure 3.1.1: QA Methods

Figure 3.1.2 shows typical QA system. Any typical QA system consists of three basic phases. Question processing, document analysis and answer analysis. Question processing phase pre-process user question using tokenization, stop word removal, parsing, stemming to extract keywords and reformulate the query. The document processing phase retrieves related documents containing keywords using ranking algorithms and returns the ranked documents. In answer analysis phase, the system identifies the suitable answer sentence and validates the correctness of the answer and finally presents the answers to the user.

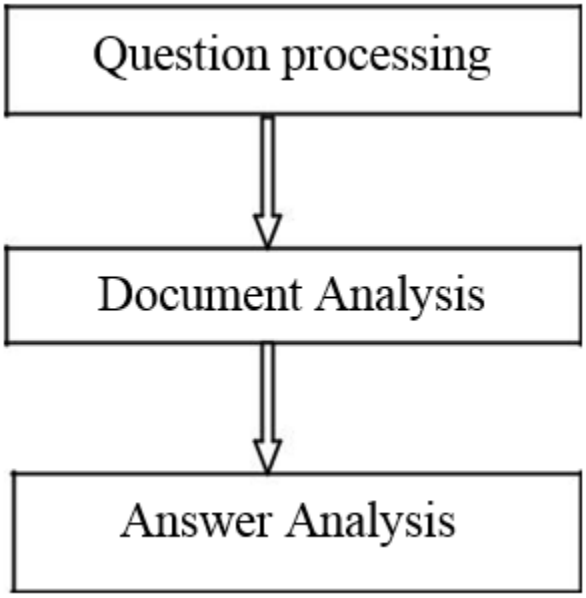

Figure 3.1.2: Typical QA System

System Architecture

The process of question answering is question analysis, information retrieval and information extraction. The accuracy of a QA system mainly depends on stored data in knowledge base which provide correct response to user query [8].

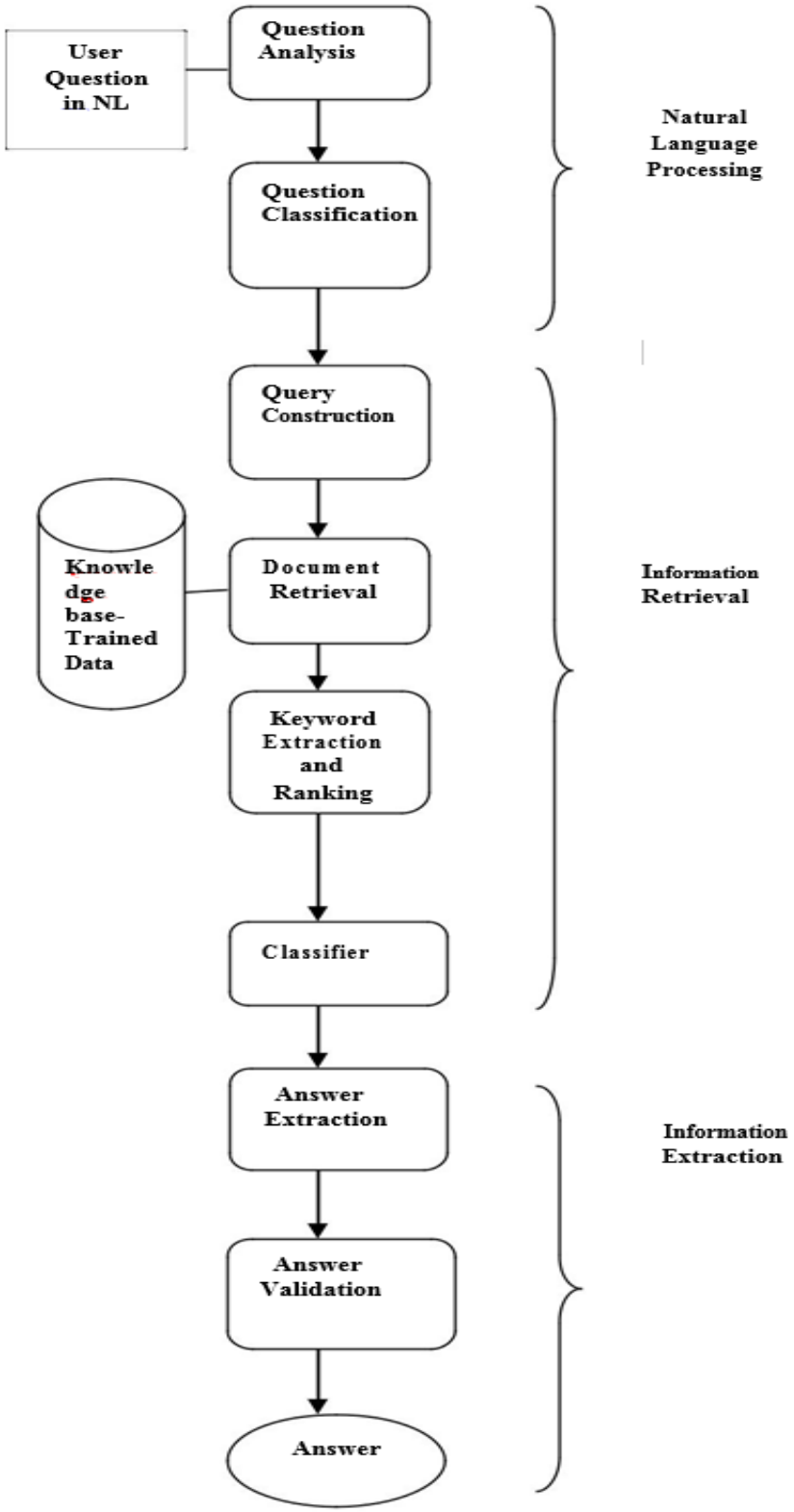

Figure 3.1.3: General QA System Architecture

NLP Approaches:

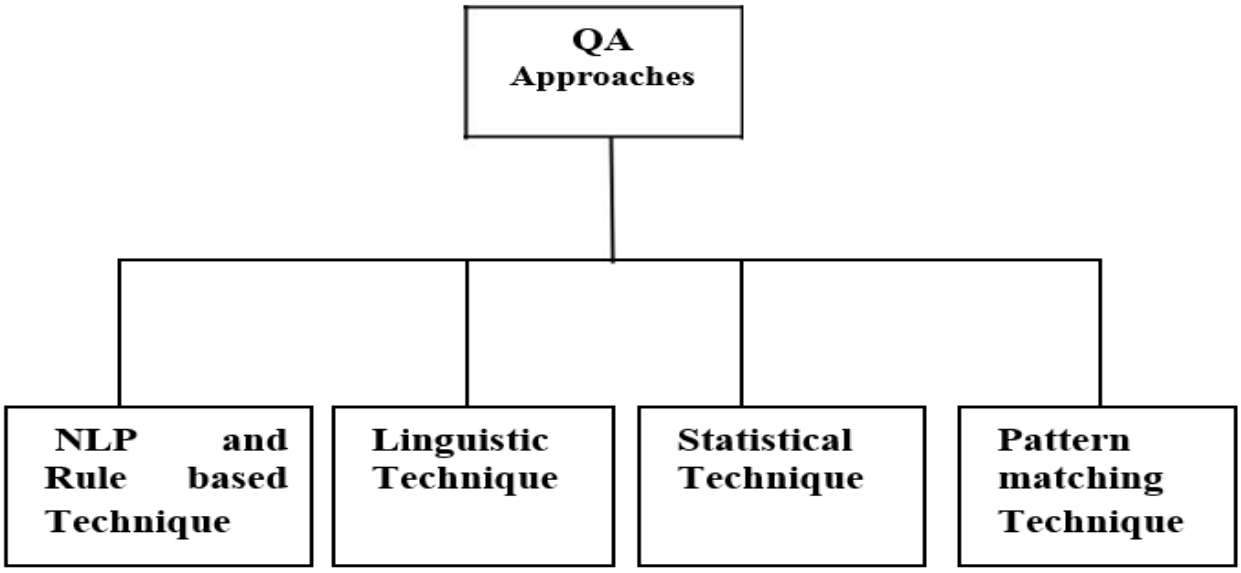

Figure 3.1.4: QA Approaches

NLP and Rule based Technique

Rule based technique is used for structured or semi-structured documents, generally used for text based systems. In rule based technique, documents are retrieved based on manually prepared rules, where rules are learned from training data. In NLP based machine learning technique, rules are defined automatically using sample labelled documents. NLP based machine learning technique has high recall and lower precision than rule based approach. So NLP based machine learning technique replaced rule based technique for text classification [9].

Linguistic Technique

Linguistic approach is implemented using tokenization, POS tagging and parsing to formulate precise user query to extract precise answer from the knowledge database. Most of the QA systems apply their own techniques to store information from web documents in their local knowledge database and apply linguistic techniques for answer generation. QA systems depends on linguistic approach were built upon knowledge base for specific domain, which provides efficient and correct answer [8].

Statistical Technique

The importance of statistical approach increased due to rapid growth in available online text repositories and web data. It is classical information retrieval system. Statistical approach is also termed as “bag of words”. In the statistical approach system , all words in the document is characterized as a set of keywords called index terms and a weight to each term is attached according to their importance which depends on frequency of occurrence in the document. Major drawback of statistical approach is that they treat each term independently and fail to identify linguistic features for combination of words and phrases. The important work based on the statistical method was IBM’s statistical QA system.

Pattern matching Technique:

This approach replaces many competing approaches with the use of communicative power of text patterns. Two types of pattern matching QA systems are surface pattern and template pattern. In surface pattern based approach extracts correct answer from either human created patterns or automatically learned patterns through examples. These patterns are like regular expressions, but designing set of patterns requires a lot of human skill and time .This approach has high precision. A template based approach is preformatted framework for questions which have entity slots which has to be dynamically filled by parameters. This approach is based more on demonstration rather than interpretation of questions and answers.

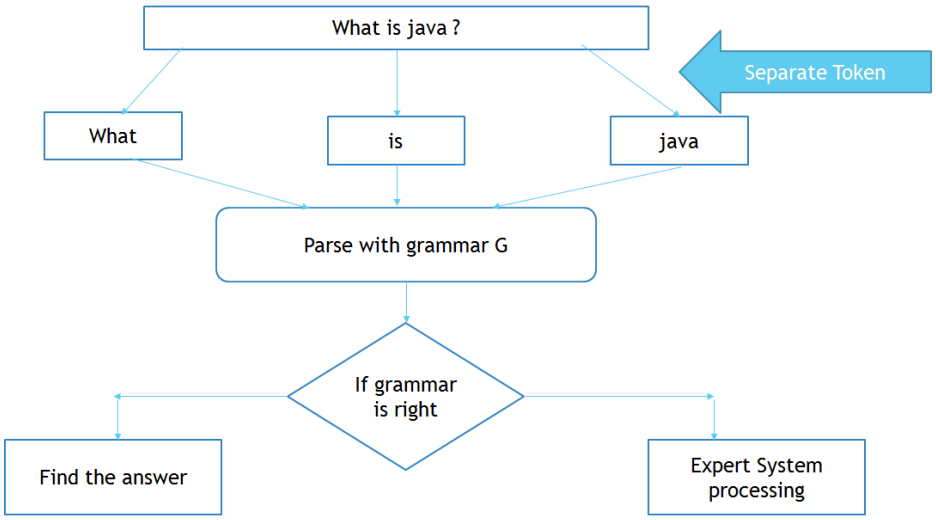

Figure 3.1.5: Example Of NLP

3.2. SYSTEM ANALYSIS AND DESIGN:

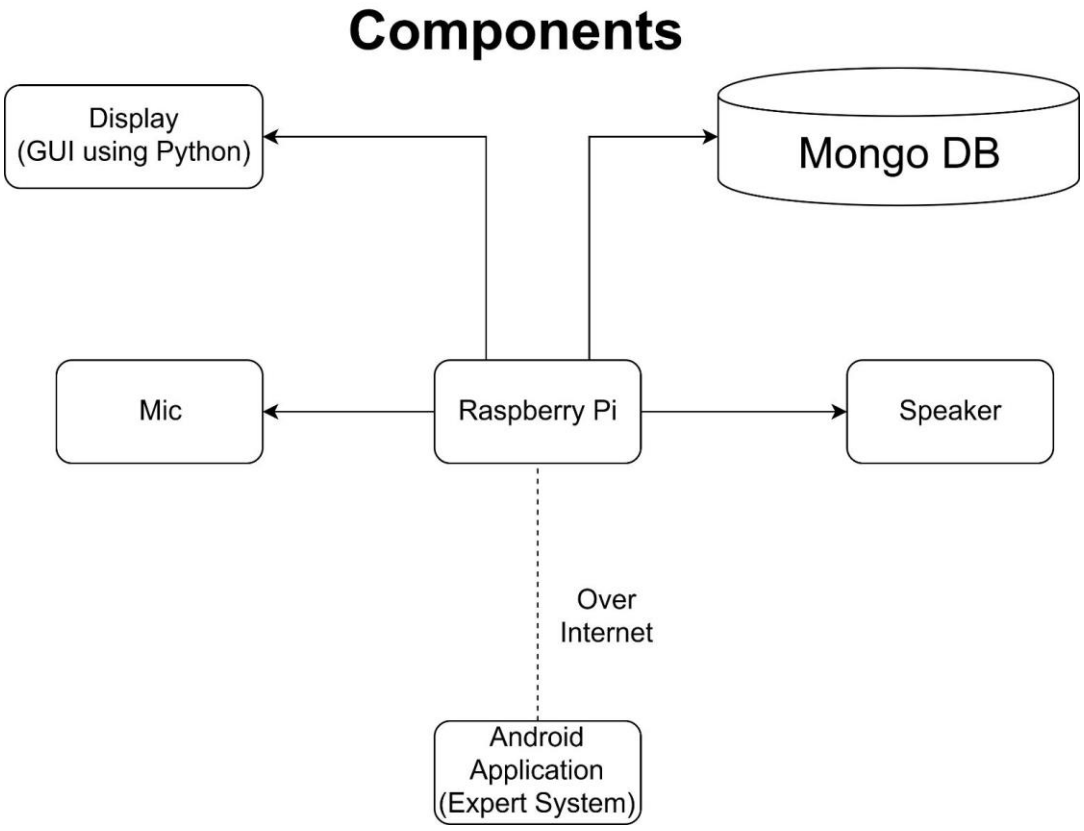

Figure 3.2.1: Component Diagram

The system is divided into four modules:

MongoDB database module:

In this module, the complete database of project will be stored. This will majorly be divided into two types i.e. the fixed knowledge and the knowledge that will be learned by expert system or while teaching process [6].

Raspberry pi Module:

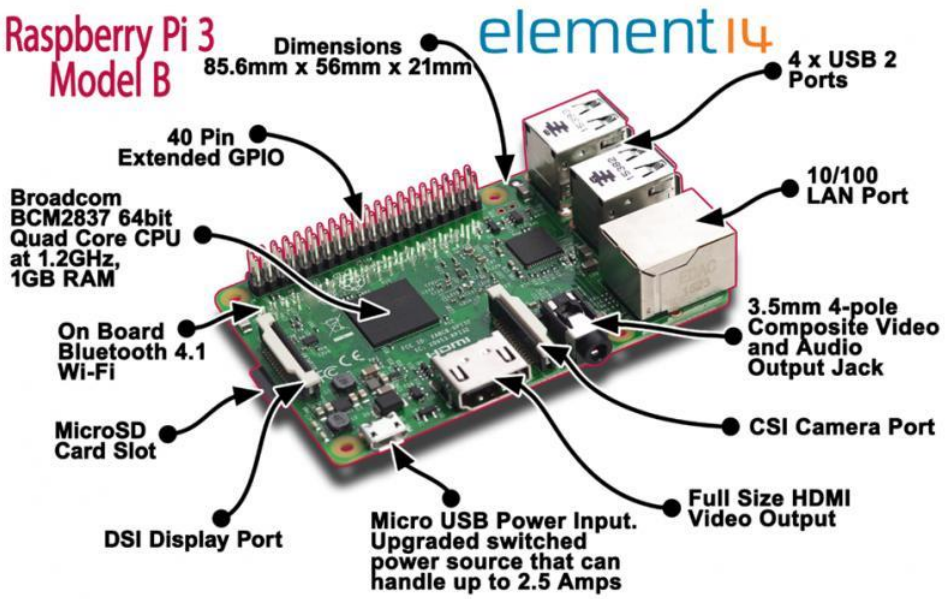

Figure 3.2.2: Raspberry Pi 3

This is a standalone computer system module which can act as complete computer. In this project Raspberry Pi 3 module will be used as a central system. It will also contain the core logic about language processing. [11]

Python UI Module:

Figure 3.2.3: Python UI

The UI will be completely based on Python T-kinter library. The UI will be set on raspberry pi module, which can be connected to any display [5].

Expert System Module:

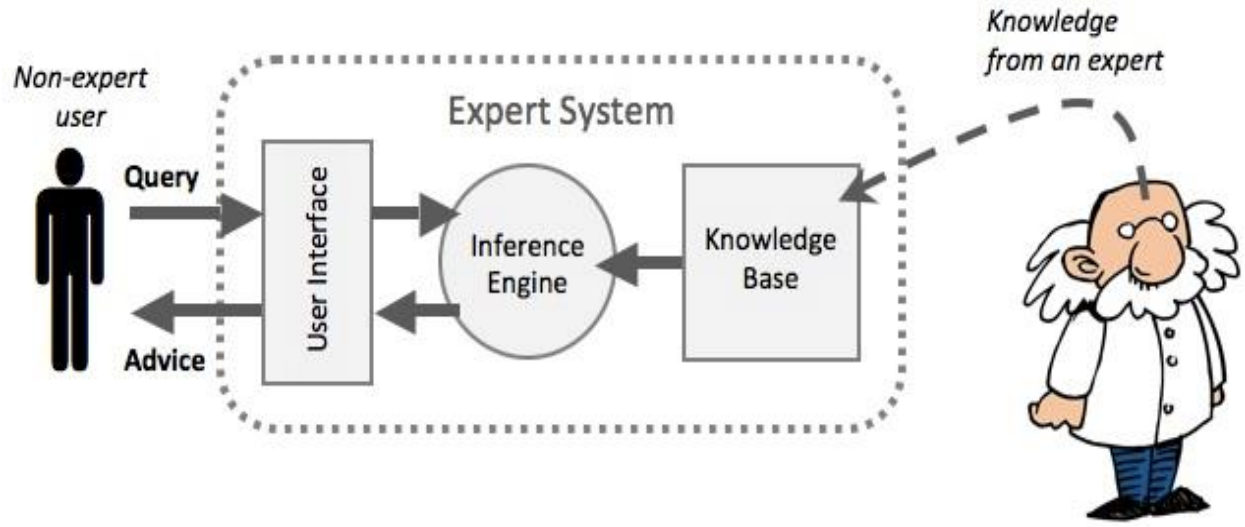

Figure 3.2.4: Expert System

This will basically be an android application that will be stored on expert person mobile phone. Whenever system will have any problem, it will contact the expert person via internet and the android application. [3]

Flowchart:

"Intelligent Programming Learning System" is an AI based teaching and learning system which will be able to communicate via speech recognition and will be able to process question asked by user and generate answers either using by database or by expert system.

Algorithm/Flowchart

1. Formation of programming database.
2. Teaching process.
3. Taking question input by users.
4. Processing the question using NLP.
5. Connecting with expert systems.
6. Generating answer using database/expert system.
7. Presenting answer using UI.

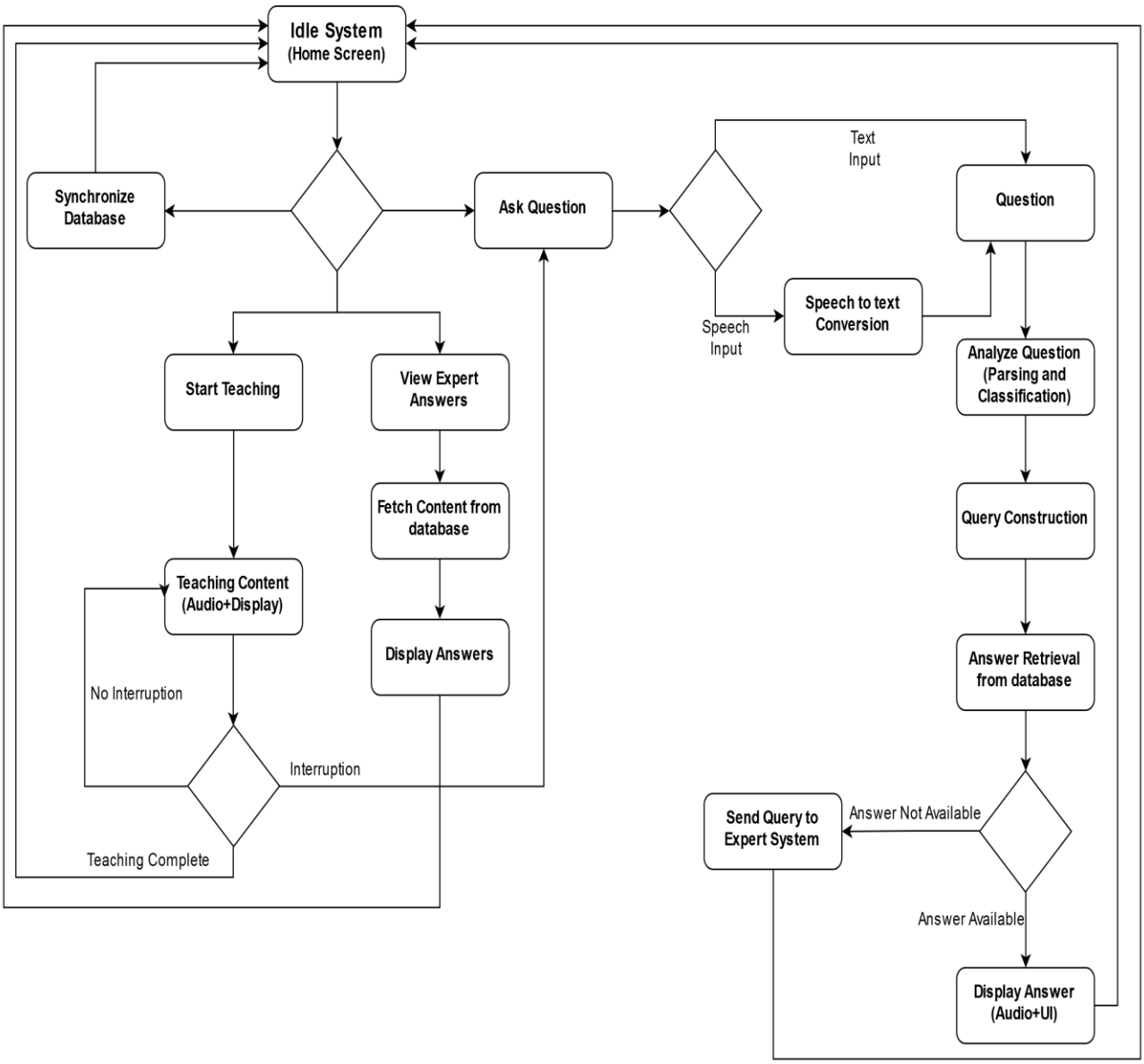

Figure 3.2.5: Flowchart

3.3. DESIGN DETAILS AND PROJECT TIMELINE:

Data Flow Diagram:

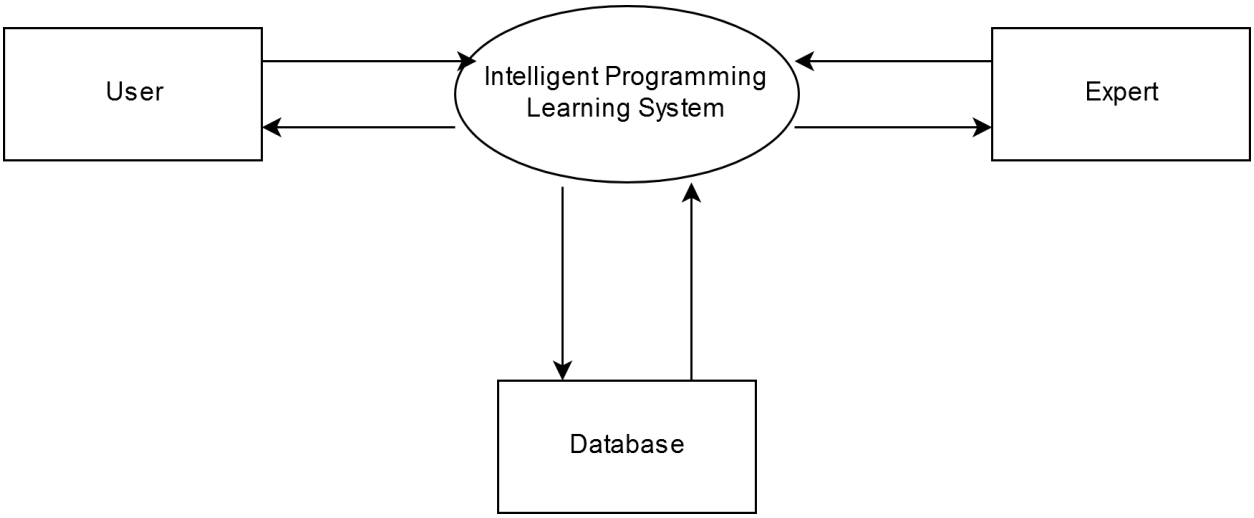

Figure 3.3.1: DFD Level 0

Following will be the main four modules for the Data Flow:

Intelligent Programming Learning System (The Core Logic):

It will work as the core logic for the whole system. This will be basically an algorithm that will be used to generate answer whenever a question is asked by the user.

User:

The user will start learning process with raspberry pi system, when-ever it will have any doubts or query he/she can communicate with system via keyboard or speech input.

Mongo DB:

The raspberry pi module will take input and will search for proper answer in Mongo DB Database module and will generate answer using it.

Expert System:

If the answer won't be available the system will contact to the expert that will be based on android platform system via internet and will try to retrieve an answer from experts.

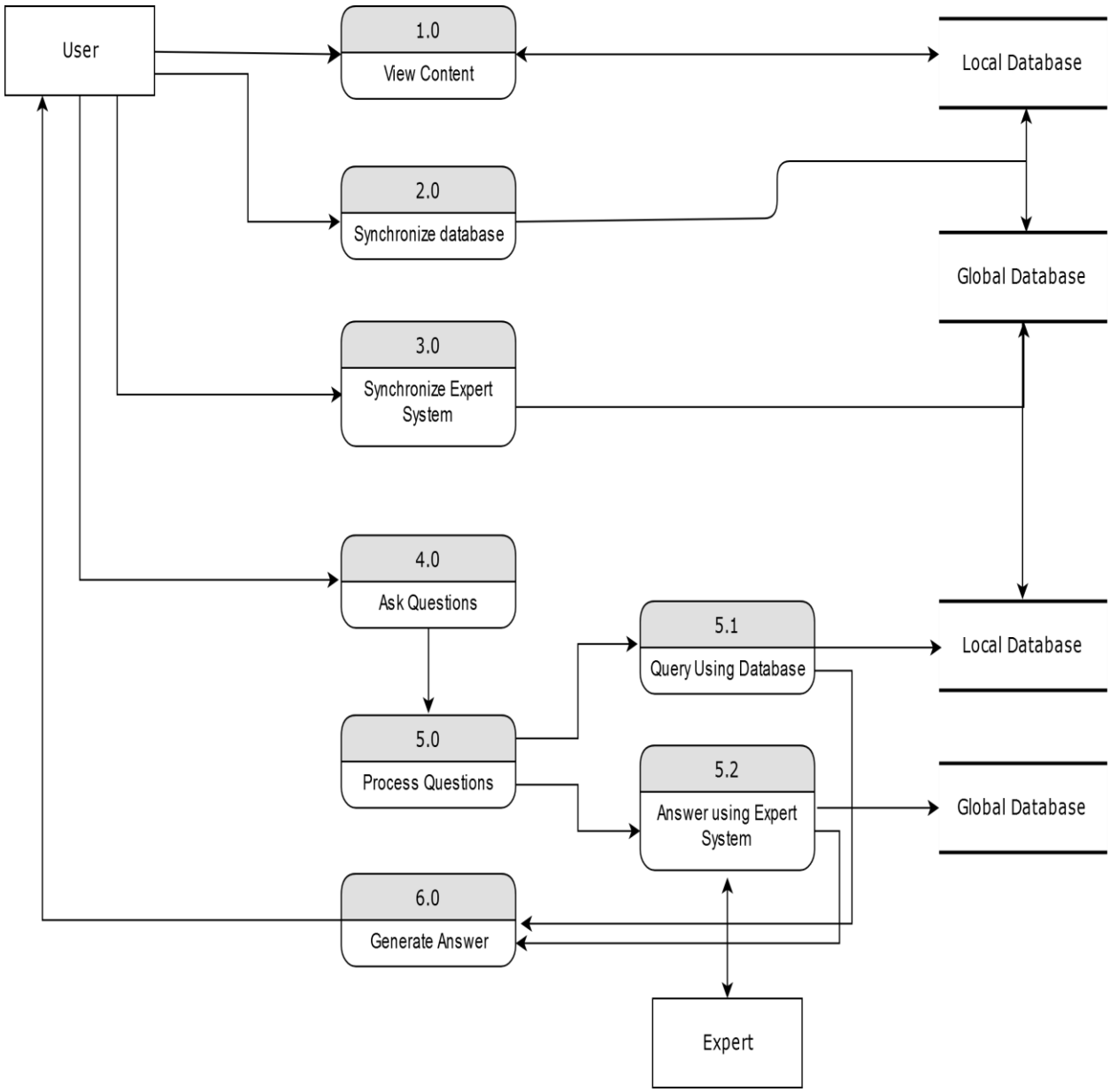

Figure 3.3.2: DFD Level 1

Use Case Diagram:

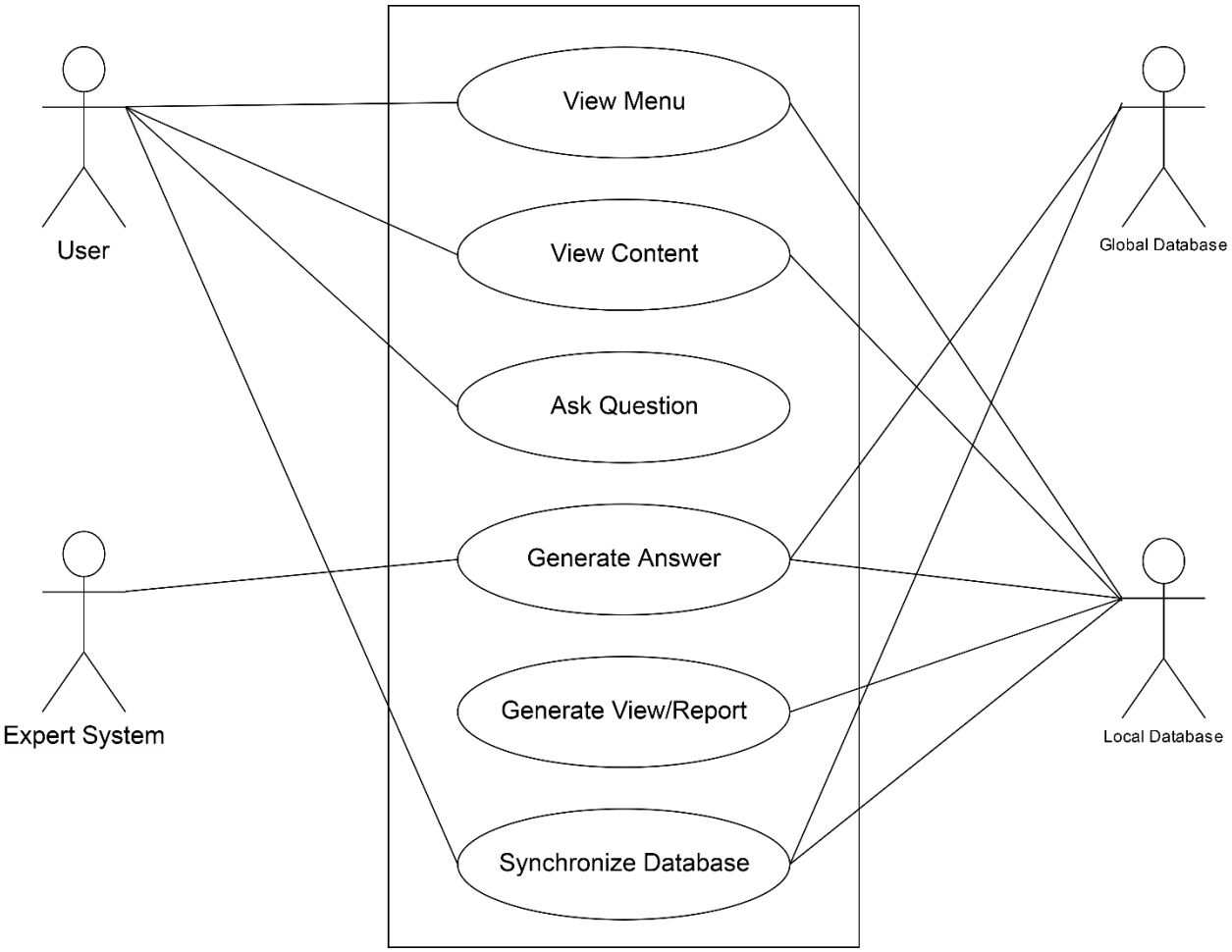

Figure 3.3.3: Use Case Diagram

Project Timeline:

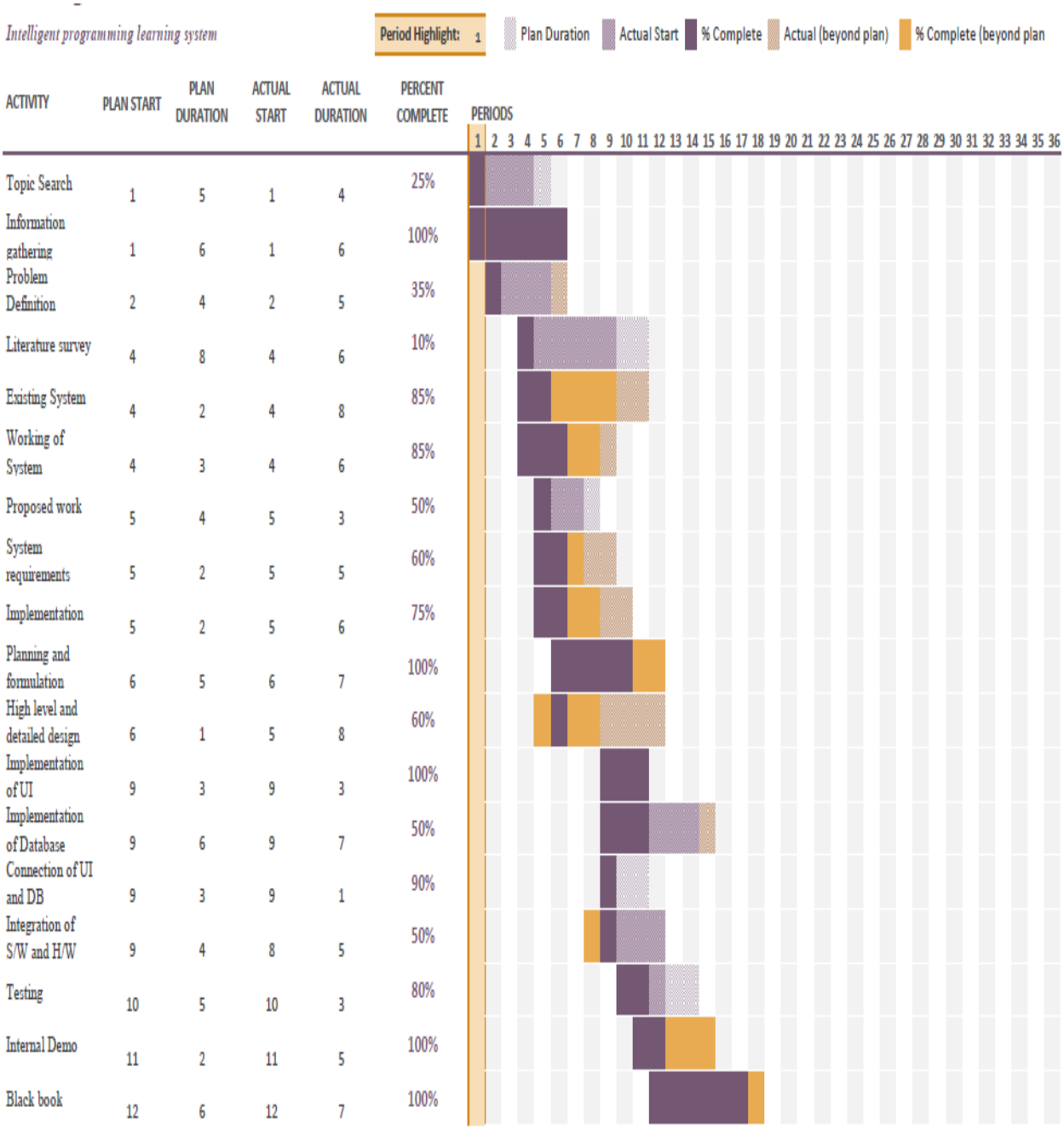

Figure 3.3.4: Project Timeline

3.4 PROJECT REQUIREMENT:

Hardware:

- **Raspberry pi 3:**

  It is a credit card sized minicomputer. It has 900 MHz quad-core ARM Cortex-A7 CPU, ram of 1 GB, 4 USB ports out of which one port is connected for Wi-Fi connector, 40 GPIO pins for interfacing external devices, CSI (camera serial interface) port for camera connection.

- **Mic Module:**

  Mic module that will be connected to raspberry pi 3 module to take speech as an input from user.

- **Android Device:**

  The expert system will be based on an android application. Hence android device with minimum configuration as a 1 GB RAM and 50MB memory space will be required.

Software:

- **Operating System:** Linux, Android
- **Programming language:** python, Java
- **Database:** Mongo DB

Chapter 4

IMPLEMENTATION

4.1 Pseudo Code for NLP implementation

1. Take input question
2. Send question to NLP module
3. For all defined question types:
    a. Tokenize the question
    b. Tag tokenized question
    c. Define grammar for this type
    d. Test this grammar with this input
    e. if grammar match:
        i. generate query according to question type
        ii. get data from database
        iii. if data available:
            1. return answer for the question
        iv. else:
            1. return answer unavailable, send to expert system
    f. else:
        i. repeat from step 3
4. return answer

4.2 Pseudo Code for Mongo DB Handling

1. Take user requirements
2. Connect to global/local database according to requirement
3. Generate query
4. Retrieve data from database
5. Return Data

Chapter 5

TESTING

Testing:

Testing is the process of evaluating a system or its component(s) with the intent to find whether it satisfies the specified requirements or not. In simple words, testing is executing a system in order to identify any gaps, errors, or missing requirements in contrary to the actual requirements.

According to ANSI/IEEE 1059 standard, Testing can be defined as - A process of analyzing a software item to detect the differences between existing and required conditions (that is defects/errors/bugs) and to evaluate the features of the software item.

Verification & Validation: These two terms are very confusing for most people, who use them interchangeably. The following table highlights the differences between verification and validation.

The following aspects are to be considered for stopping the testing process:

- Testing Deadlines
- Completion of test case execution
- Completion of functional and code coverage to a certain point
- Bug rate falls below a certain level and no high-priority bugs are identified
- Management decision

S.N.	Verification	Validation
1	Verification addresses the concern: "Are you building it right?"	Validation addresses the concern: "Are you building the right thing?"
2	Ensures that the software system meets all the functionality.	Ensures that the functionalities meet the intended behavior.
3	Verification takes place first and includes the checking for documentation, code, etc.	Validation occurs after verification and mainly involves the checking of the overall product.
4	Done by developers.	Done by testers.
5	It has static activities, as it includes collecting reviews, walkthroughs, and inspections to verify a software.	It has dynamic activities, as it includes executing the software against the requirements.
6	It is an objective process and no subjective decision should be needed to verify a software.	It is a subjective process and involves subjective decisions on how well a software works.

Types of Testing

Black-Box Testing

The technique of testing without having any knowledge of the interior workings of the application is called black-box testing. The tester is oblivious to the system architecture and does not have access to the source code. Typically, while performing a black-box test, a tester will interact with the system's user interface by providing inputs and examining outputs without knowing how and where the inputs are worked upon.

The following table lists the advantages and disadvantages of black-box testing.

Advantages	**Disadvantages**
• Well suited and efficient for large code segments. • Code access is not required. • Clearly separates user's perspective from the developer's perspective through visibly defined roles. • Large numbers of moderately skilled testers can test the application with no knowledge of implementation, programming language, or operating systems.	• Limited coverage, since only a selected number of test scenarios is actually performed. • Inefficient testing, due to the fact that the tester only has limited knowledge about an application. • Blind coverage, since the tester cannot target specific code segments or error-prone areas. • The test cases are difficult to design.

White-Box Testing

White-box testing is the detailed investigation of internal logic and structure of the code. White-box testing is also called **glass testing** or **open-box testing**. In order to perform **white-box** testing on an application, a tester needs to know the internal workings of the code.

The tester needs to have a look inside the source code and find out which unit/chunk of the code is behaving inappropriately.

The following table lists the advantages and disadvantages of white-box testing.

Advantages	**Disadvantages**
• As the tester has knowledge of the source code, it becomes very easy to find out which type of data can help in testing the application effectively. • It helps in optimizing the code. • Extra lines of code can be removed which can bring in hidden defects. • Due to the tester's knowledge about the code, maximum coverage is attained during test scenario writing.	• Due to the fact that a skilled tester is needed to perform white-box testing, the costs are increased. • Sometimes it is impossible to look into every nook and corner to find out hidden errors that may create problems, as many paths will go untested. • It is difficult to maintain white-box testing, as it requires specialized tools like code analyzers and debugging tools.

Test Case:

Test Case ID	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Pass /Fail
TC01	Check menu and Expert answer.	1. Open the software. 2. Check all the chapters. 3. Check expert answer of asked question. 4. Check exit button.	Software	1. All chapter should be there. 2. Expert answer should be there. 3. Exit button should be working.	As expected .	Pass
TC02	Synchronization button.	Click on Synchronize button.	Software	Synchronization with global data.	As expected .	Pass
TC03	Check content of chapter	Click on chapter	Software	1. All chapter should be working 2. All contents are proper. 3. View theory should show theory of given content. 4. Next chapter Should open next chapter.	As expected	Pass

TC04	Check start listening button and Stop listening button	Click on start listening button and stop listening	Software	1. Should be able to listen theory. 2. Should stop the reading content	As expected	Pass
TC05	Check Ask question button	Click on ask question button	Question	1. It should open new window. 2. Write question should give proper answer. 3. Speak question Should give proper answer	As expected	Pass
TC06	Check refresh expert button	Click on Refresh expert button	Software	It should show all the answer given by the expert system	As expected	Pass

Chapter 6

RESULTS AND DISCUSSION

6.1. SNAPSHOTS:

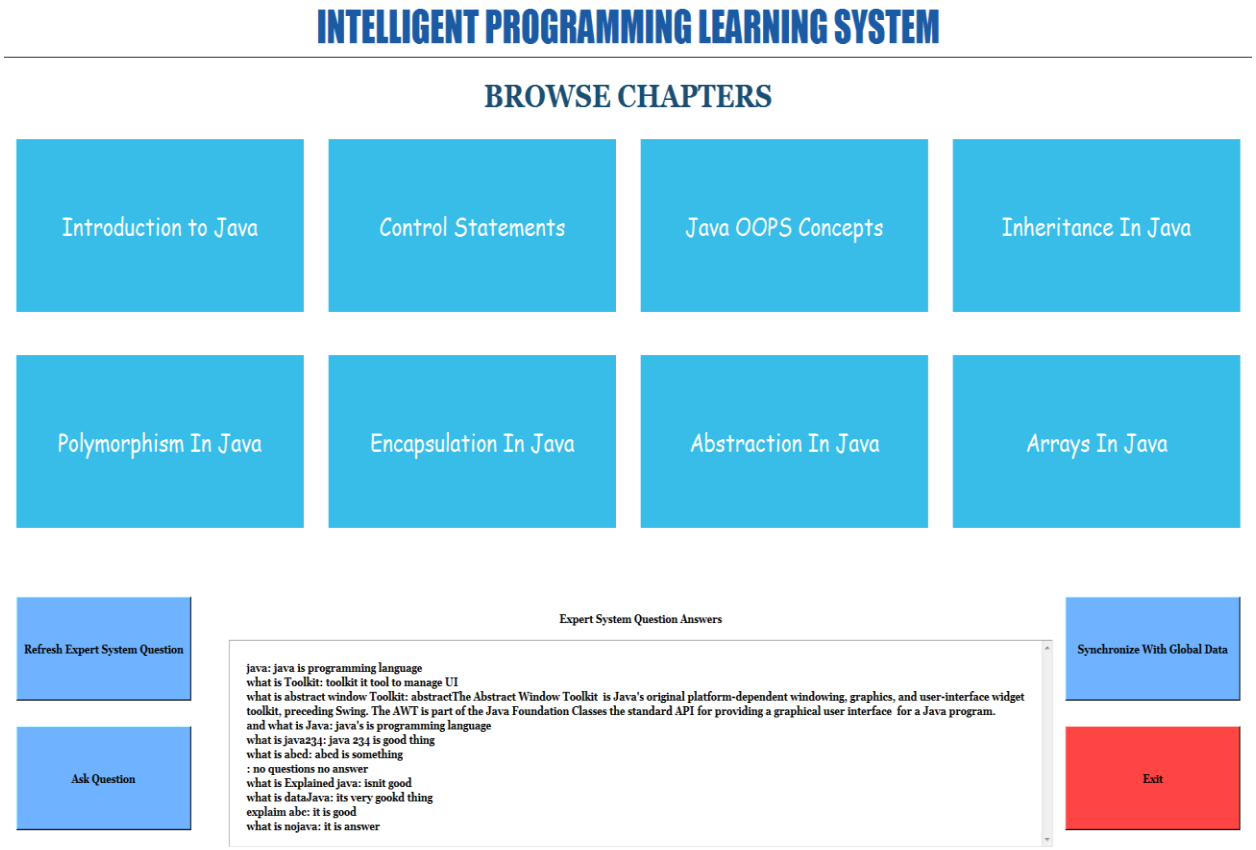

Figure 6.1: Menu Page

It is primary window after opening software which shows all the available chapters, and navigation to every function of software with exit button.

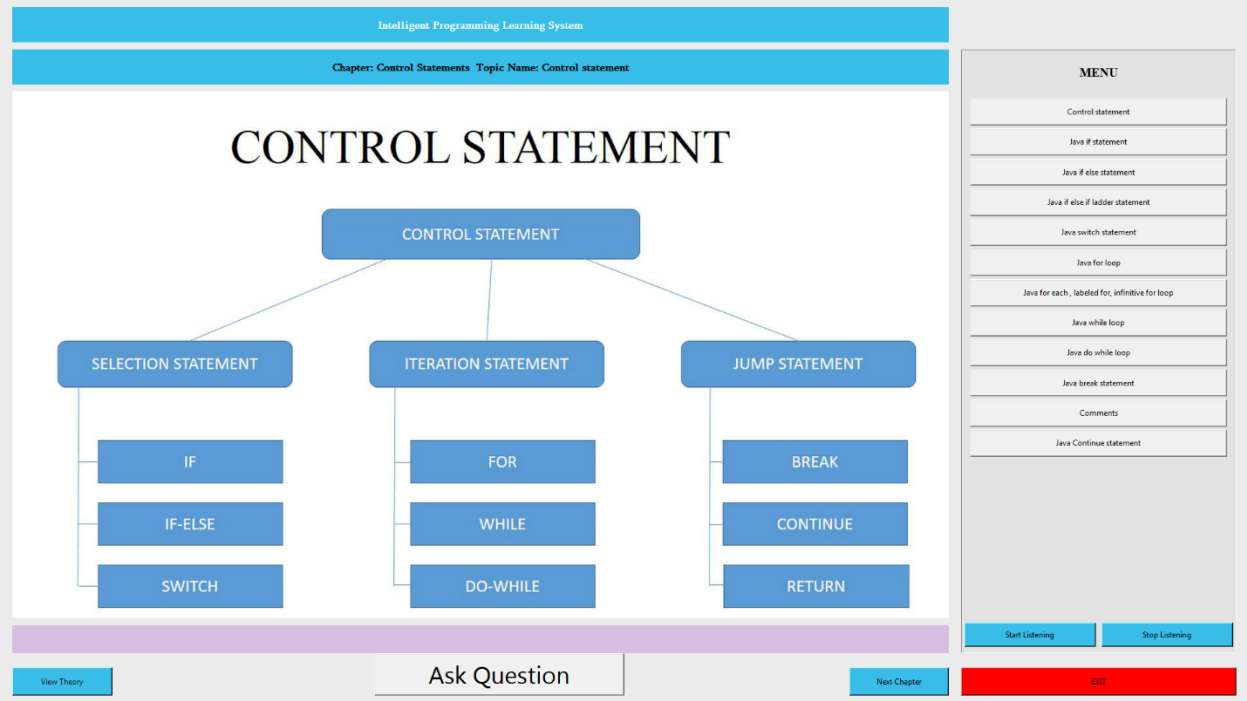

Figure 6.2: Content Page 1

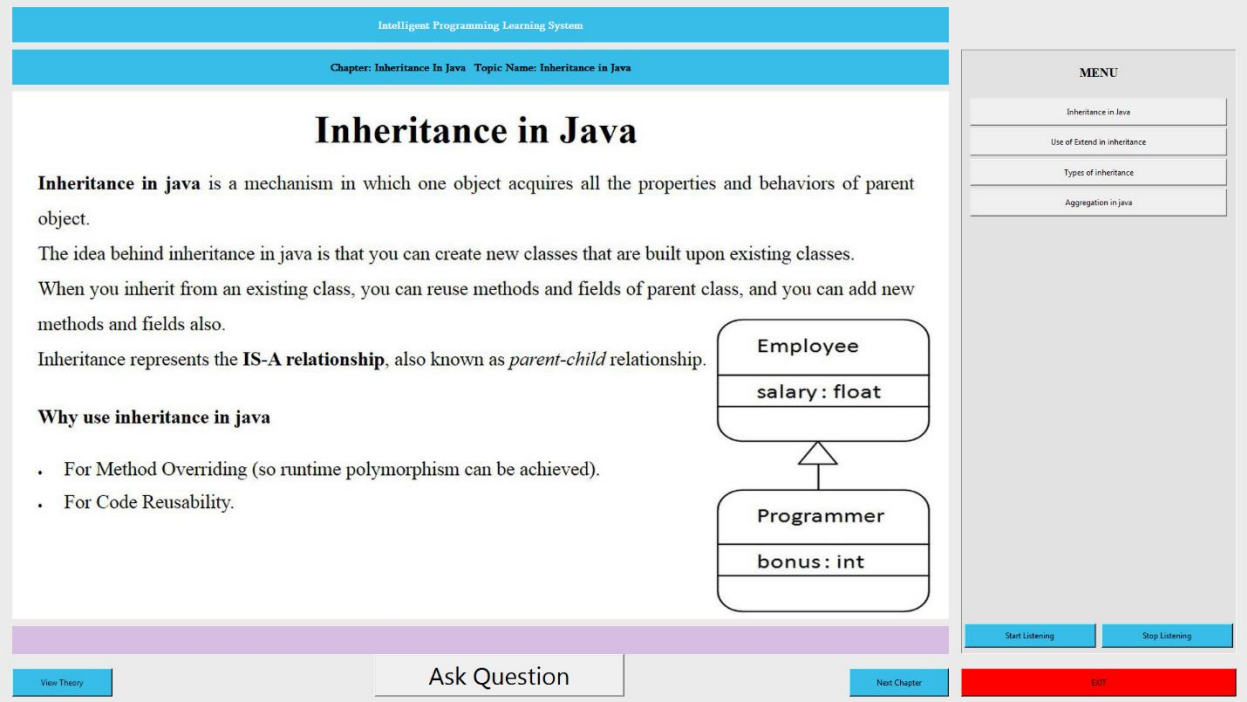

Figure 6.3: Content Page 2

It is a secondary window of the software which describes sub-topics available in right side and detail description of sub-topics will be shown on left side with listening option.

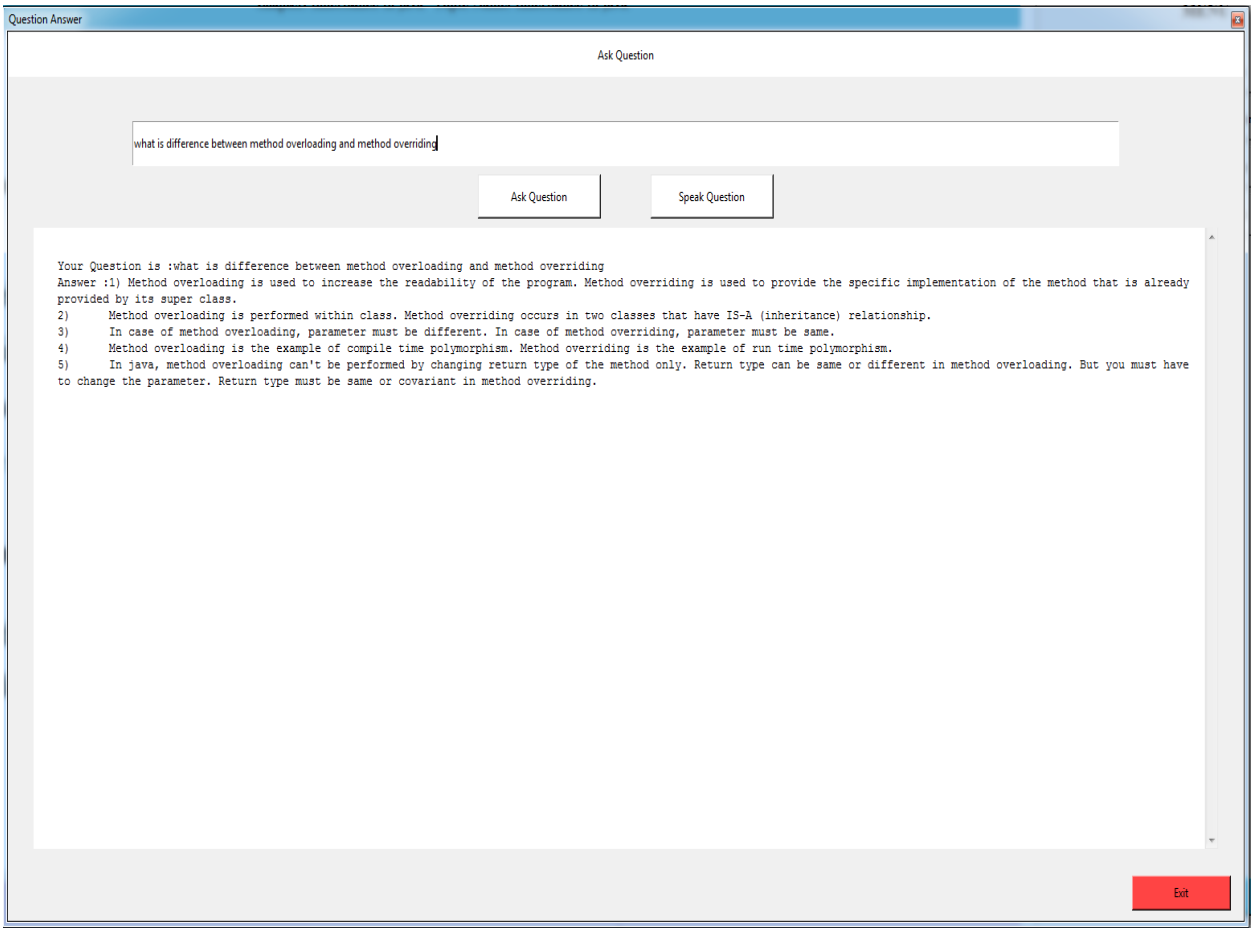

Figure 6.4: Ask Question Page

It is pop-up window which appears on clicking ask question button, wherein a user can ask question either by speech or text.

Chapter 7

CONCLUSION AND FUTURE WORK

7.1 CONCLUSION:

"Intelligent programming learning system" is a self-learning system for a user, where he/she can learn the language anywhere and anytime he/she wants. It is portable as he/she can carry it anywhere. The project is basically generated for those who need a separate learning solution from classroom and traditional online learning. It will be able to help a lot to those who cannot afford classroom trainings and tuitions trainings.

Although having thorough knowledge of a programming language one can't remember each and every syntax of any language so this can be used to learn time to time. If used on personal level it will keep the privacy of asking basic questions. Teaching learning process in Audio Video format rather than Books is more interactive process.

7.2 FUTURE SCOPE:

- The project is basically generated for those who need a separate learning solution from classroom and traditional online learning.
- It will be able to help a lot to those who cannot afford classroom trainings and tuitions trainings.
- Also this project can be extended to the other programming languages and also for other learning solutions which will be able to revolutionize the teaching learning process.
- This project will be converted to an application from standalone so it will be easy and handy to use.
- In future the global database will be extended with lots of content that all user will be able to have answer of their question.

Chapter 8

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Programed Educational Objectives (PEO):

- To prepare the candidate for a successful career in the industry and make him acquainted with the latest software and hardware,
- To enable student to work productively as computer engineers, including supportive teamwork and leadership roles on multidisciplinary teams
- Graduates are prepared to be responsible computing professionals in their own area of interest,
- To provide the candidate with a sound foundation in mathematics, software technologies, database technologies, networking, hardware and to prepare them for post graduate studies and research programs,
- To promote the awareness of lifelong learning among students and to introduce them to professional ethics and codes of professional practice,
- To demonstrate effective communication skills in oral, written and electronic media.

Programed Outcome:-

At the end of the program, a student will be able to:

- Apply knowledge of mathematics, science and engineering.
- Utilize the computer engineering knowledge in all domains, viz., health care, banking and Finance, other professions such as medical, law, etc.
- Design and conduct experiments as well as to analyze and interpret data.
- Analyze the problem, subdivide it into smaller tasks with well-defined interface for interaction among components, and complete the task within the specified time frame and financial constraints,
- Design a system , component or process to meet the desired needs within realistic constraints such as economic, environmental , social, political and Ethical ability,
- Design, implement, and evaluate secure hardware and/or software systems with assured quality and efficiency,
- Communicate effectively the engineering solution to customers/users or peers,
- Understand professional and ethical responsibilities,
- Understand contemporary issues and to get engaged in lifelong learning by independently and continually expanding knowledge and abilities,
- Function in multidisciplinary teams, and
- Identify, formulate and solve engineering problems.

Course Objectives:

1. To understand the problem and to design and implement a solution.
2. To develop team spirit working with peers.
3. Gain Project management skill.
4. Understand career tools and market trends.
5. Get experience at meeting deadlines.
6. Acquire presentation skills.
7. To understand scope and application of the project.

Course Outcomes:

a. An ability to apply the relevant knowledge and skills, which are acquired within the technical area, to a given problem.
b. An ability to co-operatively work in a team and must meet deadline.
c. Use current tools and techniques in effective way for solution.
d. Be able to document and present one's own work, for a given target group, with strict requirements on structure, format, and language usage.
e. Understand social and ethical responsibility of working as a professional in the field of Computer Engineering.