IT Career Counselling Chatbot based on Industrial Trends

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The Department of Computer Science, National University of Computer and Emerging Sciences, accepts this thesis titled *IT Career Counselling Chatbot based on Industrial Trends*, submitted by Husni Ara (19P-0041), Attay Rasool (18P-0046), and Daniyal (18P-0043), in its current form, and it is satisfying the dissertation requirements for the award of Bachelors Degree in Computer Science.

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Abstract

The "IT career counseling chatbot based on industrial trends" could be a venture planned to offer people within the IT field a personalized and current career direction framework. The chatbot, which utilizes the extricates information from the LinkedIn and Indeed APIs to analyze current industry trends and work postings to supply exhortation based on real-world data. Leveraging characteristic dialect preparation (NLP), the chatbot can comprehend users' questions and give custom-fitted reactions, encouraging educated choices about their IT career ways. The "IT career counseling chatbot based on mechanical trends" could be a profitable instrument for the industry that empowers graduates to explore the quickly changing IT scene and guarantees that they are making educated choices around their careers. With its ability to join real-world information and give custom-made reactions, this chatbot serves as a down-to-earth arrangement for those looking for career direction within the field of IT.

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Chapter 1

Introduction

1.1 Introduction

•A career counseling chatbot counseling virtual counseling can help individuals with their career development journey.

•It can provide personalized advice and support to users.

1.1.1 What is chatbot?

Chatbot is a computer program planned to have discussions with users. The discussion is through content or voice. It employments manufactured insights (AI) to get user questions and react by agreeing to the inquiry. Chatbots are generally utilized in messaging apps, websites, or other stages to supply data, reply to questions, or help users with different assignments. They can run from essential rule-based frameworks to more progressed models that utilize machine learning to move forward their intelligence over time. Chatbots are like virtual collaborators that communicate with users in a chat-like way.

1.1.2 History of chatbot

In 1950, Alan Turing asked the address “Can machines think?” Turing conceptualized the issue as an “imitation game” (directly called the Turing Test), in which an “interrogator” asked questions to human and machine subjects, planning to recognize the human. Within the occasion that the recognizing confirmation, we say the machine can think [7]. In 1966, Joseph Weizenbaum at MIT made the essential chatbot that, apparently, Alan Turing posed the request, "Can machines think?" in 1950.

Turing identify the issue as an "impersonation amusement," or what is presently known as the Turing Test, where an "interrogatory" postured questions to both machine and human members to recognize the individual. We announce a machine to be competent of thought in case it is identifiable [7]. 1966 saw. MIT teacher Joseph Weizenbaum created the primary chatbot that, in hindsight, 2 1.4 Chatbot history nearly passed for a human: ELIZA. In the event that given a sentence as input, ELIZA would recognize catchphrases and compare those terms to a foreordained set of rules to deliver appropriate answers [8]. There has been headway within the advancement since ELIZA.

Sending of chatbots with more noteworthy insights. In 1972, Stanford’s Kenneth Colby created Repel, The Loebner Prize, which respects the foremost brilliant chatbot and tries to run the Turing Test every year, has been won three times by ALICE [10]. Current chatbots comprise of Ama Microsoft’s Cortana, Apple’s Siri, and Amazon’s Reverberate and Alexa [11].

The building plans and These bots’ recovery forms use machine learning headways to their advantage. Utilizing advanced "data recovery" methods, where answers are created based on examination of look motor comes about. A few have grasped "generative" models as well.

In reaction, they "interpret" input utilizing factual machine interpretation (SMT) methods. expressions into the answers that are created. Seq2Seq, a repetitive neural network-based SMT calculation as of now suggests hone is to utilize neural systems (RNNs) to encode and interpret inputs into reactions.

1.1.3 Problem Statement

Generally, graduates, youthful understudies, and specialists express questions approximately their work choices as well as discontent with their current positions. With moo student-to-advisor proportions or, in a few cases, no committed admonitory administrations at all, it can be troublesome for understudies to discover satisfactory career exhortation.

1.1.4 Motivation

It can provide users with information on various career paths, including job titles, required education and training, and salary expectations. It can be accessed anytime from anywhere with an internet connection, making it more accessible than traditional counseling services. Traditional career counseling can be expensive, but this chatbot provides an affordable alternative that can be used by anyone with internet access.

Chapter 2

Review of Literature

2.1 Carreer Counseling Chatbot On Facebook Messanger Using AI

Created a chatbot application, [1], to offer graduates and students job counselling services. Determine the resources needed to implement the chatbot application, such as APIs (Application Programme Interfaces), algorithms, and the most recent data on career counseling to serve as the foundation for the queries. to create a chatbot that can be expected to comprehend input from users and provide pertinent, timely responses.

One clever and effective way to deliver this service is through the application of artificial intelligence (AI). The definition of artificial intelligence (AI) is "the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings," including speech recognition, language processing, visual perception, and decision-making. A chatbot is an example of this. A chatbot is an Artificial Intelligence (AI) programme that can mimic a discussion or a chat with a user in natural language via messaging services, websites, mobile apps, or phone calls. Because of their emulation of human speech, users can interact with them for a range of purposes. To achieve this, they use Natural Language Processing, which is a technique that allows computers to modify natural language To accomplish the required job, using speech or writing. Because of this, they are an extremely helpful tool in an area like job counseling. The purpose of this

project is to put a chatbot into action, make use of its capacity to recognize patterns in user input and respond appropriately.

2.2 Chatbots in Education and Research

Prospective applications of artificial intelligence (AI) systems and chatbots in academia [2], and their effects on research and instruction. Thus, to investigate the potential effects of AI and chatbots on education and how they might affect the validity of evaluations, the first study topic was created. If chatbots are going to change the way academic research is conducted, it is the subject of the second research question. What possible ethical issues could arise from using AI and chatbots in research and education is the third research topic. In general, this research will look at the benefits and drawbacks of chatbots and AI systems, as well as how they might supplement human knowledge and judgment.

2.3 Development of an AI Chatbot to support admissions and career guidance for universities

In the future, artificial intelligence applications will be extensively searched for. The development of an AI chatbot to support admissions and career guidance for universities is described in [3] Nonetheless, academics and parents still lack a thorough understanding of this field, and there are still a lot of unanswered concerns and challenges that need professional guidance and assistance. In order to properly assist students and parents, the career counseling team must develop industry knowledge and get training in an appropriate and understandable interpretation approach. Training a whole team of consultants will be quite time-consuming and labor-intensive, and there will be many opportunities for experience gaps. Creating a chatbot is the ideal solution. A chatbot can work around the clock, 365 days a year. Additionally, the chatbot automatically responds to requests from parents and children in a prompt, consistent manner, with specific optimization for instances that repeat themselves. This helps to improve the reputation, quality, and image

of the university for parents and applicants by reducing errors, saving manpower, boosting guidance quality, and increasing experience when dealing with the university. The creation of the data collection for enrollment counseling, responding to inquiries, creating, coding, and incorporating chatbot.

2.4 Career Counselling Chatbot Using Cognitive Science and Artificial Intelligence

A chatbot [4] is employed to accomplish this, which is a computer programme that uses artificial intelligence and cognitive science to replicate human discussions. The bot allows users to initiate chats via SMS, Facebook Messenger, Skype, Slack, and other methods. The chatbot will initially inquire for personal information from the user. The bot will then administer a battery of psychometric tests, including the Big 5 exam to determine a user's general personality and the Holland test to recommend the best job alternatives. The bot will recommend a list of employment options that are a good fit for the user based on the results. After the user chooses a job, the chatbot will begin guiding the user to acquire all the skill sets required for that specific career. This entire user database will be kept in MongoDB. The chatbot will record the user's facial expressions and textual responses during interaction in order to identify the user's interests. The bot will generate, maintain, and periodically update a progress report in the user's E-portfolio throughout the training process. Both the user and employment providers will benefit from this portfolio in identifying the user's true skill set.

2.5 Text And Voice-Enabled Chatbot Enhancing The User Experience

In general, these bots have a set domain. The content is [5] Typically, these domains have predetermined business norms. All that is required of the chatbot is that it operates and produces outcomes by the business rules. There are five parts to this architecture.

The knowledge database is the most crucial element among the voice-to-text and text-to-speech synthases, dialogue managers, natural language generators, automatic speech recognizers or text interpreters, and others. These elements come together to create a conversational bot that is specific to a given domain. The conversation manager is the agent who communicates with the user and assists them in finding information or completing tasks. These conversation facilitators support search and discovery for information retrieval. The primary solutions for that domain are available in the knowledge base. After the user's inquiry.

2.6 A Chatbot to Assist Students In Programming Tutorial

Students in innovative Technology programming classes are urged to come up with unique and innovative solutions to open problems. During tutorial sessions,[6] professors and teaching assistants provide support for this "tinkering" style. Because the assignments are open-ended, teaching assistants must take great care to comprehend each student's unique programs and issues in order to offer guidance on both functional and high-quality code. This takes a lot of time and strong TA abilities. It is beneficial if students are able to pose appropriate inquiries regarding their issues. The debugging their peers programme is a great resource for students that are able to learn. Techniques for engaging with people on social media can inspire them to do so. StackOverflow and other well-known QA sites frequently employ this. Working with such a platform early on can assist students in further pursuing programming abilities independently, as these platforms are an essential component of the programming community outside of Creative Technology.

2.7 Designing and evaluating three chatbot-enhanced activities for a flipped graduate course

One of the biggest challenges that instructors still have when creating their curricula is getting their students[7] to interact with the online course materials before the in-person sessions. Additionally, it can be challenging for students to get insightful feedback during the asynchronous preclass sessions, which could lower their level of engagement with the material. When interacting with their pre-class online course materials, for example, students might wish to look for opportunities to assess their understanding. However, because the pre-class online environment is asynchronous, the teacher might not be able to provide prompt feedback. If timely feedback is not offered or provided, Chen and Yao claim that learners in a virtual learning environment (VLE) feel alone. When incorporating e-learning components, this isolation is a significant drawback. Unfortunately, the developers of these chatbots created them with a specific purpose in mind, thus it will be challenging for us to adapt them for our study. Furthermore, there is a paucity of information in the literature about chatbots employed in master's programme courses, especially when it comes to adult education.

2.8 A review of chatbots in education: practical steps forward

When requesting information about a product,[8] the user types straight to this chatbot or chooses from a pre-made menu. One advantage of this chatbot is its pre-programmed menu: instead of typing directly to the chatbot, users are more likely to click on buttons, which lowers the likelihood that the chatbot won't be able to respond to them. Another effective marketing strategy is to link to a website, since doing so increases the likelihood that consumers will explore the content and make a purchase. It's hard to find chatbots on the internet that focus primarily on answering queries rather than trying to direct users to a website. One of the causes of this is that several businesses prefer to keep up the

appearance

Sr No	Basic Idea	Methodologies	Result	Limitation
1	By using NLP to tell students about university programs	Using LSTM and then NLP to analyze the users' demand	Giving suggestions for college programs	Can't differentiate between fake and authentic users
2	To interact with users using speech-to-text for their convenience	Using Apache, Web Server, SQL, NLP	Gives industrial suggestions to a certain level	Can't hold conversation to a certain level
3	Latest career guidance considered and developed on Messenger Facebook	Facebook SDK, Messenger API, JavaScript, Wit.ai API	Help users by providing CV templates, Job listing	Limited to Facebook users, Needs high-speed internet, The system cannot hold a lot of conversations
4	to offer accessible and personalized career advice to students	developed on Juji.Inc. (a company that allows users to create personalized chatbots)	provide job listings and interview preparation tips	The bots conversation was carried out by using an actual counselor

Table 2.1: Comparision Table of Chatbot

Chapter 3

Project Vision

3.1 Objectives

To provide career guidance and advice to individuals in the field of IT by utilizing a chatbot that incorporates current industry trends and developments.

3.2 Project Scope

It can be useful for the industry/practical world by providing personalized and up-to-date career guidance to individuals, helping them make informed decisions about their IT career paths.

3.3 Preprocessing Data

Cleaning the data, removing stop words, tokenizing, stemming, and vectorizing like word embeddings or Bag-of-Words.

3.4 Model Architecture

The architecture building has adopted a model based on deep learning. Langchain which intrect with Openai and IIama.

3.5 Developing the Chatbot Flow

Developing a list of inquiries and answers that the user can provide the chatbot in response to their input. To control the chatbot's flow, we employed rule-based systems or decision trees.

3.6 Training the Model

Feeding the model with a large amount of data to learn and adapt to the patterns and trends in the data. With using transfer learning to speed up the training process.

3.7 Testing and Deployment

Test the chatbot to ensure it is functioning as expected and then deploy it to the desired platform as Web Application.

Chapter 4

System Analysis

System design and analysis is planning a structure to meet the requirements, where we break down the complex system into simple and manageable parts. Then understand how these parts interact and design a solution to achieve the desired result. It helps us in creating effective and efficient solutions to understand the real-world problem.

4.1 Use Case Diagram

A case diagram speaks to the user interaction with the framework beneath the advancement handle. It makes a difference to recognize all the forms of the framework which are visualized in ovals, known as a utilize case. A case diagram is drawn from a situation that clarifies the workings of the framework. The Use Case diagram of the system is represented in 4.1.

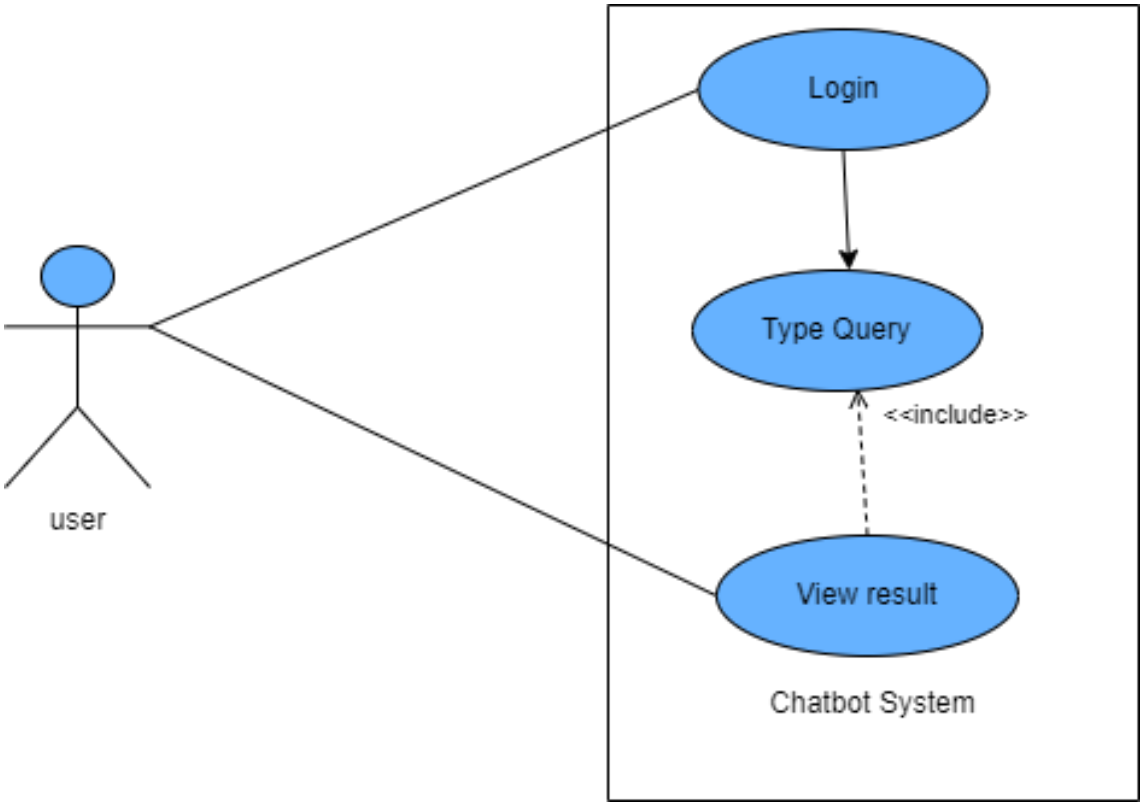


Figure 4.1: Use Case Diagram

4.2 Flow Chart Diagram

A flowchart diagram is a visual representation of a process or system's sequential phases and decision points. A flowchart, which consists of several forms like diamonds for decisions, rectangles for operations, and arrows for flow direction, offers an organized and unambiguous representation of the movement of data or activities. The links between the shapes in the figure show the sequence in which these decisions and actions take place. Each shape in the diagram represents a distinct action. Several disciplines, including software development, business operations, project management, and system design, heavily rely on flowcharts. They are useful instruments for defining complex procedures, identifying obstacles, and promoting a thorough comprehension of the workflow as an entire system. The Flowchart Diagram is illustrated in Figure 4.2.

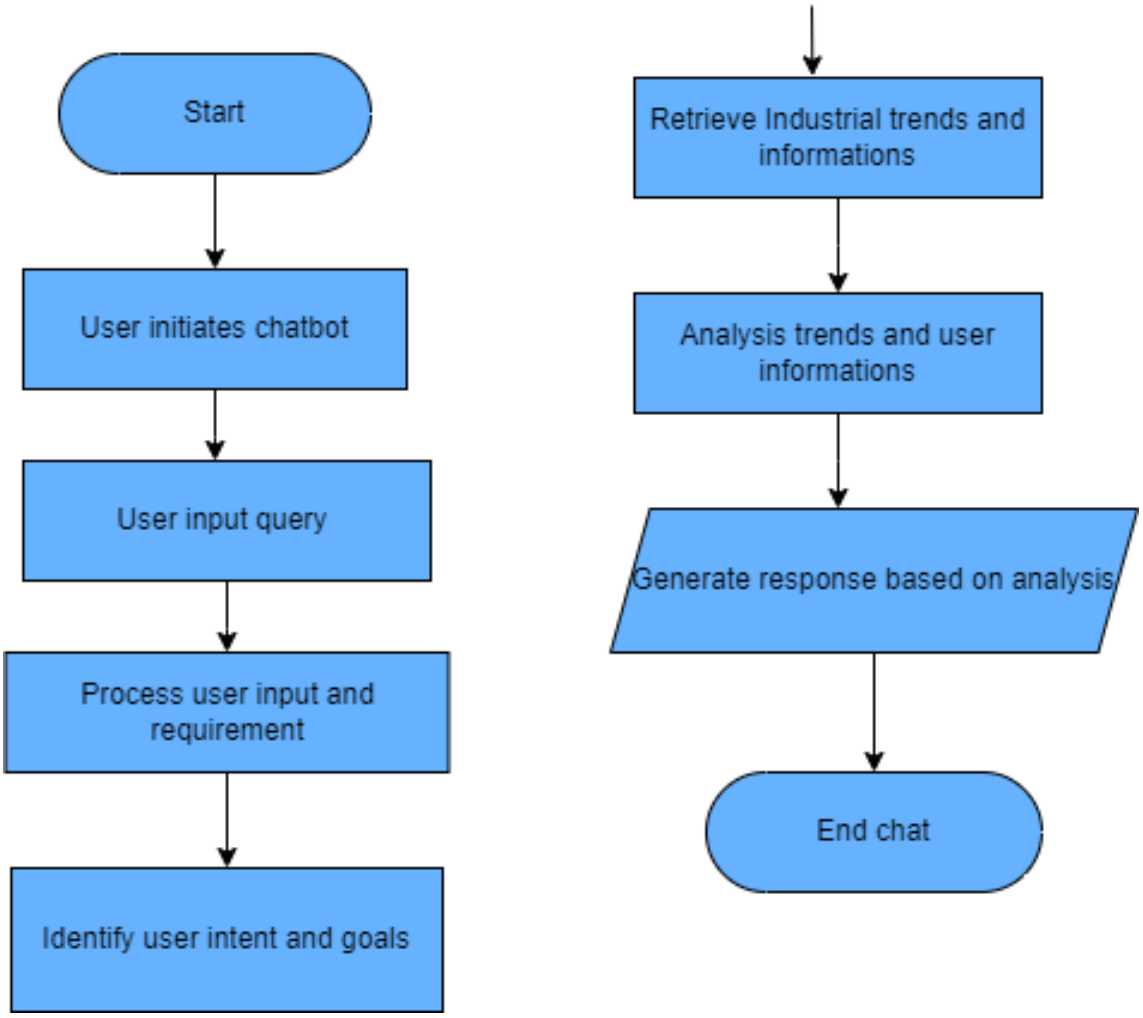


Figure 4.2: Flow Chart Diagram

4.3 Activity Diagram

An activity diagram is a figure that shows how tasks move through a system and highlights the constantly changing components of a workflow or process. It is an effective technique for process analysis and system modeling. Different activities are represented by nodes in an activity diagram, and arrows show the control flow between these activities. Usually, a brief explanation of the action or procedure each activity represents is included. A system's concurrent operations, decision points, and action sequences can all be easily understood by referring to Figure 4.3. It helps to identify possible enhancements or changes to software systems, business processes, and intricate workflows. The Activity Diagram depicting the system's workflow is illustrated in Figure 4.3.

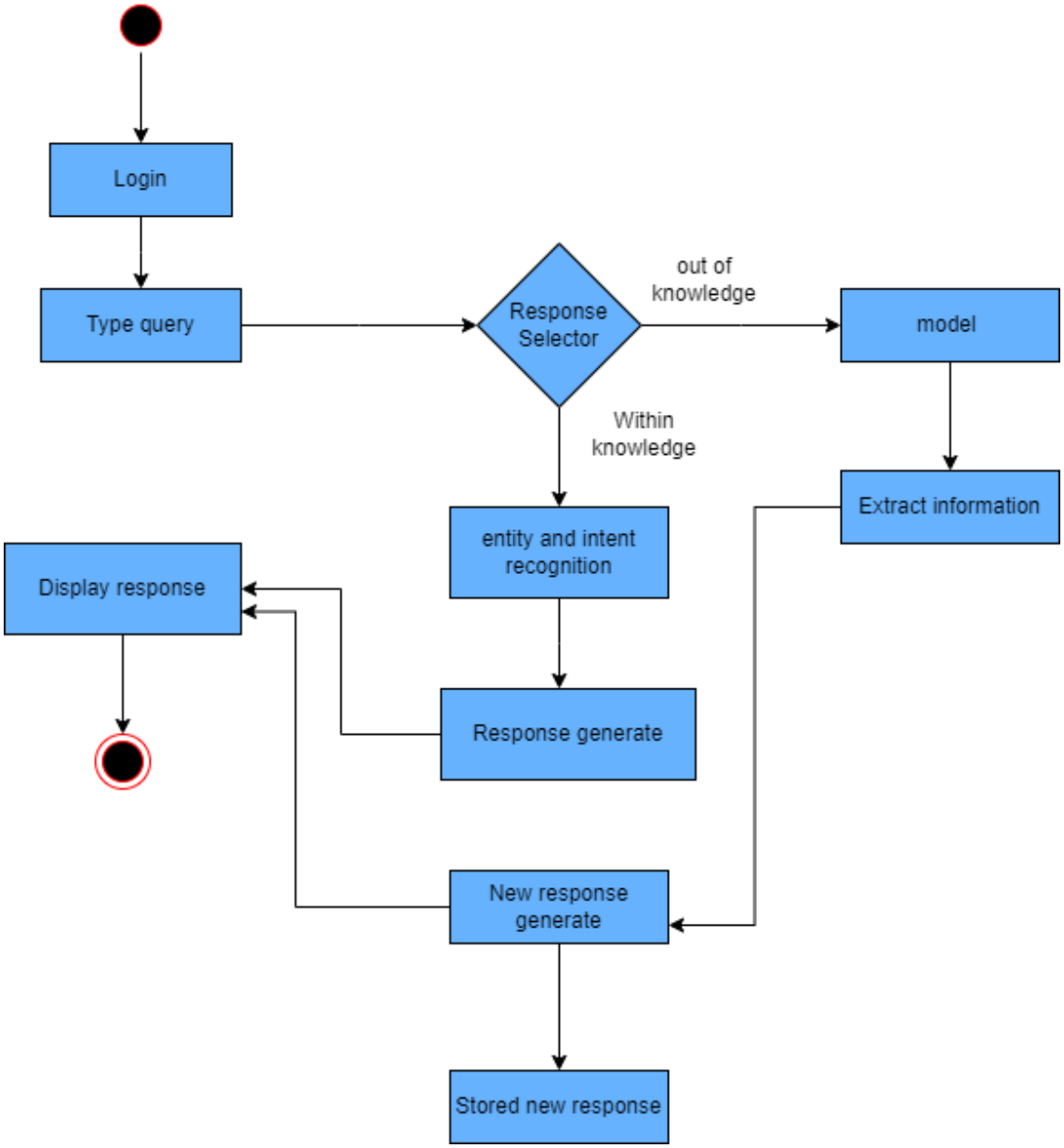


Figure 4.3: Activity Diagram

4.4 System Architecture

A System Architecture Diagram gives an illustration of a system's elements, connections, and interactions while providing a high-level overview of the system's structure and organization. The architecture of a complicated system, including its hardware, software components, data storage, communication protocols, and external connections, can be understood using this figure as a basic design. Usually, each component is shown as a block or node, with connections between them illustrating the interdependence or information flow. System architecture diagrams are very useful for explaining the design concepts, reasoning behind decisions, and general structure of the system to stakeholders, including developers, architects, and project managers. The System Architecture Diagram is depicted in Figure 4.4.

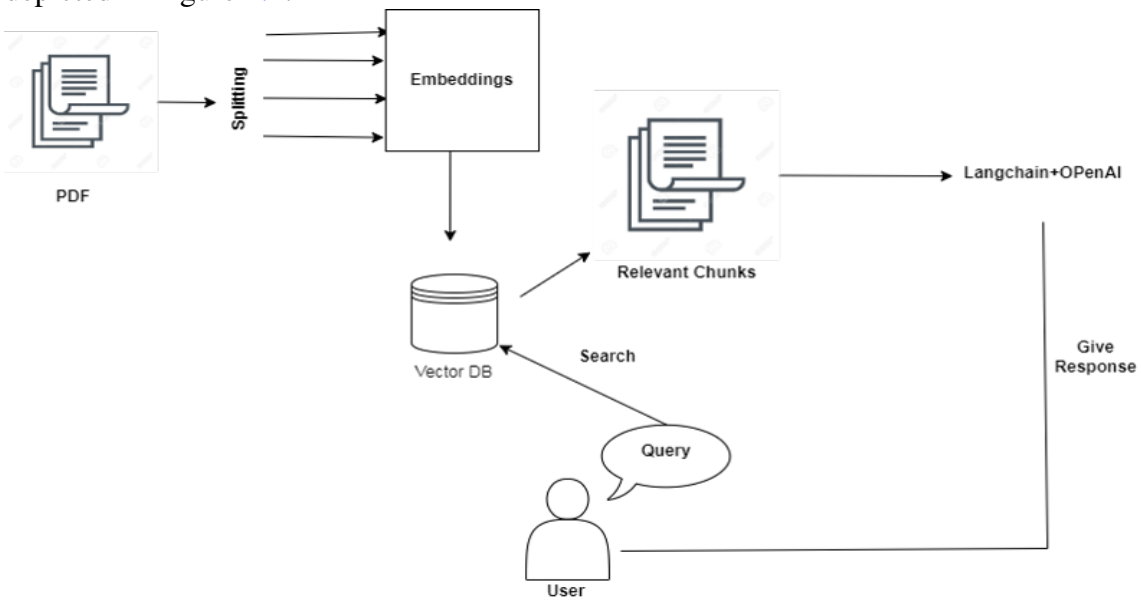


Figure 4.4: System Architecture

Chapter 5

Methodology

The chatbot we designed is a web-based application, user interact with the chatbot through this web page by the login. While signing users are given the choice to sign in with their current login information for reliable websites like Facebook or Google. This eliminates the need to make a new account, especially for the chatbot. The user is successfully signed into the chatbot after their identity is confirmed and authorization is given. Flask is used as a backend language, it handles the communication between the user's browser and the server, it also defines the route of different pages of the chatbot, After login, the user is now in the position of typing the query. PromptHelper python module is used to pre-process and clean user input extracting entities or important data from user queries. Giving users access to format or organize prompts for interacting with underlying models or modules using utility functions. The query is then searched in the vector database, GPTSimpleVectorIndex module used for indexing, searching, and retrieving vectors. This model works in conjunction with the GPT model involving natural language understanding. The llama python library we used in the model contains the functionalities related to indexing and searching directories. LLMP Predictor is a Python module used in the model which responsible for figuring out and determining user intent regarding inquiries, industry trends, and career-related inquiries. SimpleDirectoryReader is a class from the llama index library, it is used to read and retrieve information from the directories. chatbot uses this library to access and obtain a list of job guides, industry reports, and relevant information according to the user's query. It retrieves information and filters results. Sub-

mitting questions to the lang-chain model which interacts with the OpenAI model so it can grasp natural language. producing replies that are contextually appropriate based on predictions made by the OpenAI model. Controlling the status and context of the communication. Using the extensive language capabilities offered by OpenAI, the ChatOpenAI class within an IT career counseling chatbot comprehends and reacts to user inquiries on IT careers, skills, and industry trends. The system's development proceeds through several carefully planned steps, which is depicted in Figure 5.1."

5.1 Data Acquisition

The Data Set used in this project lists the different jobs in the IT field, the skills required for these jobs, and their trends in the IT industry. The data set provided to the model is in PDF form, the splitting of data extract information creates embedding and then stores it in the vector database. Splitting, data extraction, embedding, and storing in vector databases take some steps.

5.2 Text Extration

To extract the text from a PDF document the Python library used here is PyMuPDF. This is helpful for the extraction of text from the pdf document.

5.3 Text Preprocessing

After the extraction of the text clean and preprocess the extracted data normalizing the text, which involves removing unnecessary characters. This step ensures that the data is suitable for analysis.

5.4 Embeddings Words

After preprocessing the data is converted into embeddings, which is the vector representation of the preprocessed data. The Python library Spacy is used for word embedding.

5.5 Documents Embeddings

Combine the word embeddings to create document embeddings. In this step, the words aggregate into a signal vector representation of the whole document.

5.6 Persistence of Vector

Store the embedding documents in the vector database. Our data is complex which we cannot store in an ordinary database, that is why it is stored in a vector database. This is all about the dataset used in our project. As the IT industry is rapidly growing, trends are changing in the industry day by day. We will update the dataset according to the trends.

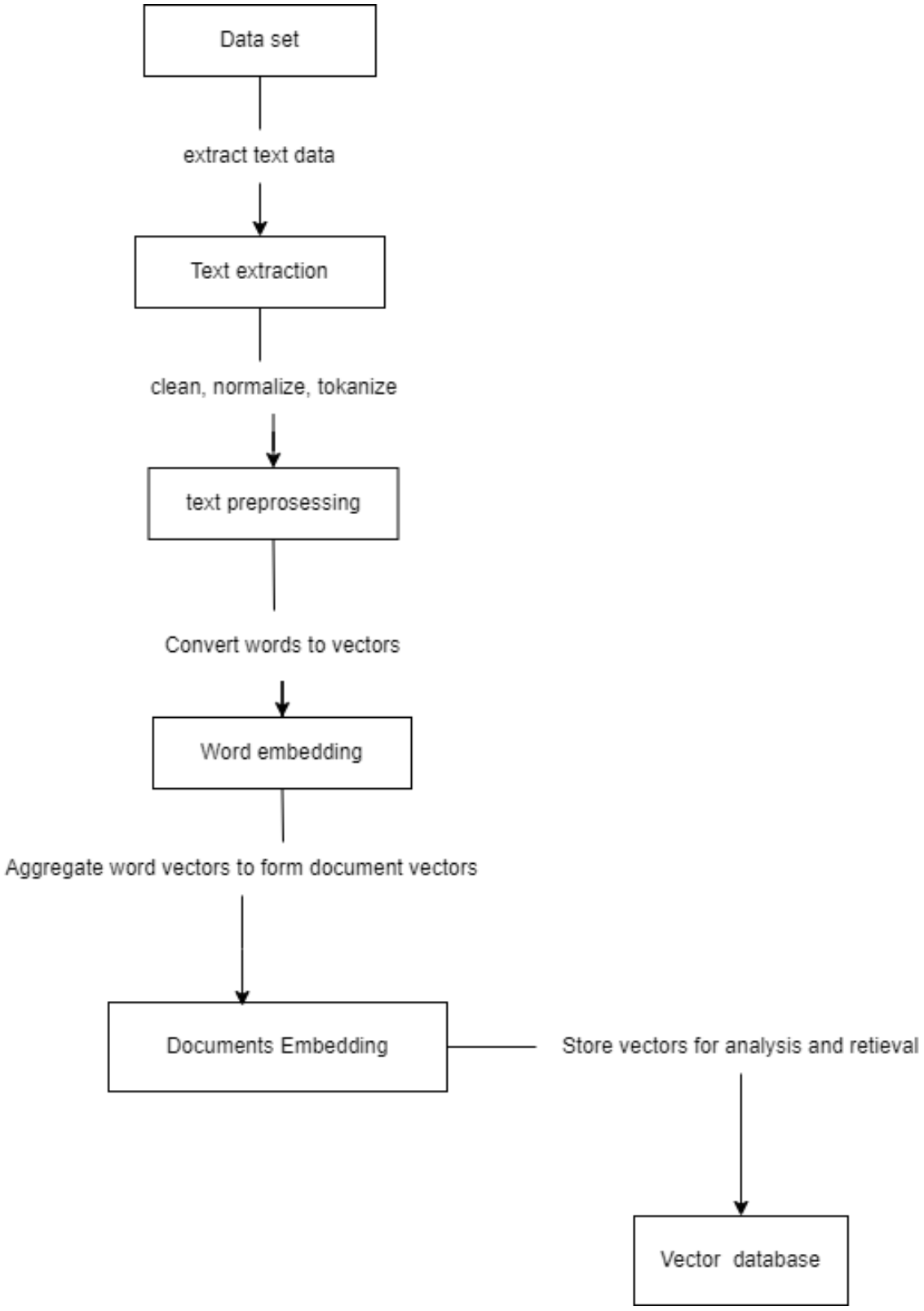


Figure 5.1: Data Flow

Chapter 6

Iteration 1

6.1 Introduction

We laid the groundwork for something truly amazing during our initial iteration of the IT Career Counselling Chatbot! We created a clever talking chatbot that can comprehend your inquiries about careers and provide insightful responses. Consider it as your tech-savvy friend who is well-versed in the IT profession.

We ensured the quality of our chatbot by utilizing the most recent tech industry tips and resources. It can converse with you, understand your questions, and even offer career guidance.

We're currently working quickly and strategically to improve our chatbot. We want it to function as your very own career advisor, there to support you at all times. So, keep checking back for more exciting news as we move forward to improve our chatbot even further.

Ultimately, we wanted to make sure the IT Career Counselling Chatbot is not just good but great from the very beginning! We developed a chatbot that converses like a friend and can answer the queries you may have about careers using the latest advances in technology.

We carried on after that! To ensure everything functions properly, we also thoroughly tested everything. Yet, we're excited to know what you think the next steps should be.

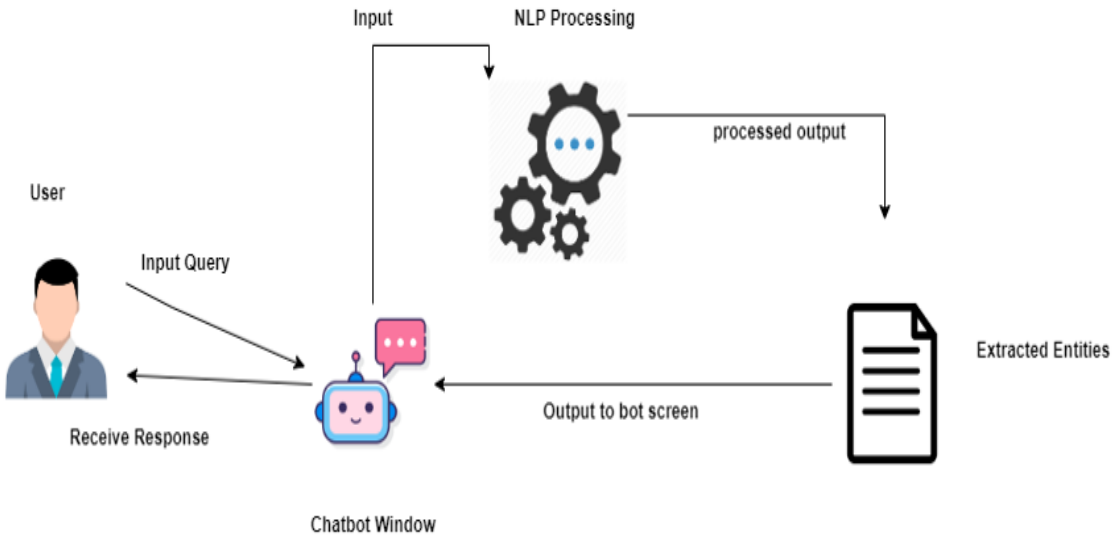


Figure 6.1: Initial Proposed System

We truly value your opinions. Get ready for the next chapter now! We plan to further develop the chatbot's intelligence, polish its responses, and pay even more attention to your feedback.

The virtual assistant presents itself as the user's IT career counselor in the first version of our chatbot for IT career counseling. The foundation for a user-focused interaction is laid by this tailored introduction. The initial proposed system is shown in Figure 6.1

6.2 Determine User Goals

The chatbot tries to learn about the user's desired career path by presenting options like launching a new career, progressing in their current IT position, or investigating particular IT fields. The main goals of the user are established in this step.

6.3 Investigate Interests

Going a step further, the chatbot welcomes the user to investigate their interests in the broad world of computer science. It offers choices in data science, networking, cloud computing, and software development as well as cybersecurity.

6.4 Determine Skills

The chatbot determines the user's skill level in order to customize its advice. On a scale of 1 to 5, it asks the user to rate their level of programming, problem-solving, and communication skills, creating a baseline for individualized guidance.

6.5 Involvement Level and Instructive Foundation

Under consideration of the assortment of instructive foundations, the chatbot inquires if the user is self-taught, includes a bachelor's or master's degree in data innovation, or has taken a distinctive course. Also, it surveys the user's proficient IT encounter and places it into built-up classifications.

6.6 Industry Patterns

The chatbot addresses industry patterns since it gets it how energetic the IT environment has ended up. It inquires the client in case they are fascinated by learning more approximately these points and emphasizes the significance of cutting-edge innovations like blockchain, manufactured insights, and DevOps.

6.7 Assets and Direction

The chatbot offers exhortation by customizing its proposals concurring with the user's interface, capacities, and showcase patterns. It makes suggestions for specific programs and materials, focusing on the requirements for organizing and getting real-world encounters through ventures.

Chapter 7

Iteration 2

Based on industry patterns, we ought to likely include more modern highlights and upgrades to Cycle 2 of the IT career counseling chatbot to keep up with the foremost later guidelines.

7.1 Natural language processing (NLP)

Increment the chatbot's understanding of questions from clients by utilizing progressed NLP strategies. The result will allow it to reply to questions with more prominent precision and detail.

7.2 Expansion of the Information Base

To grant users the foremost later experiences, including current data on work patterns, developing advances, and industry best practices to the chatbot's information base.

7.3 Machine Learning for Personalisation

Utilize machine learning procedures to make the chatbot more individualized in its counsel by basing it on the user's inclinations, past trades, and proficient foundation.

7.4 Visualization of a Career Way

Give an include that gives users a comprehensive diagram of their proficient travel by outwardly mapping out conceivable career ways based on their abilities, interests, and industry patterns.

7.5 Being associated with Work Entries

See into collaborating or integrating with employment entrances to deliver users to current employment openings that fit their capabilities and career objectives.

7.6 Integration for Client Criticism

Utilizing the chatbot interface, effectively look for user input to memorize issues, encounters, and concepts for the upgrade. Apply these comments to motivate more improvements.

Cycle 2 of the IT career counseling chatbot can create into a more valuable and created apparatus that gives clients particular and current career direction by distinguishing with these patterns.

Chapter 8

Iteration 3

Building on the advancements made in earlier iterations, we would incorporate new features for Iteration 3 of the IT career counseling chatbot, which would be based on developing industry trends.

8.1 Advanced Information Profiling of Users

Provide accurate guidance, and improve the user profiling system by using machine learning to collect more precise data regarding users' preferences, career objectives, and learning styles.

8.2 Dynamic Analysis of Skill

Provide a dynamic skill assessment function that changes based on industry trends to give users the most suitable skill recommendations for their selected careers.

8.3 Current Sector Insights

Include a feature that offers users up-to-date industry insights on things like emerging technologies, job market trends, and salary standards so they can stay informed about the

constantly changing IT landscape.

8.4 Tracking Professional Development

Give users a way to monitor their professional development over time by visualizing their achievements, skill growth, and milestones reached with the chatbot's assistance.

Iteration 3's IT career counseling chatbot can develop into an extensive and dynamic tool that stays ahead of industry trends and gives users a rich and personalised experience in navigating their IT careers through the integration of these features.

Chapter 9

Testing and Results

As we approach the conclusion of our Final Year Project (FYP), which was centered around making an IT career counseling chatbot, we are cheerful to share critical achievements and fruitful comes about. Our system's fundamental login and signup pages have been actualized, which has progressed client security and strength. Key discoveries, measurements, and bits of knowledge found all through the venture are highlighted within the segments that take after.

9.1 Testing

Testing is essential to guaranteeing the chatbot's efficiency, dependability, and satisfaction with users. This section describes the extensive testing methodology used to evaluate the many aspects of the chatbot's functionality.

Evaluation of Functionality

Determining if the chatbot can, in response to user inquiries and inputs, deliver accurate and relevant career advice. The results of test1 are depicted in Figure 9.1. The results of test1 are depicted in Figure 9.2. The results of test1 are depicted in Figure 9.3.

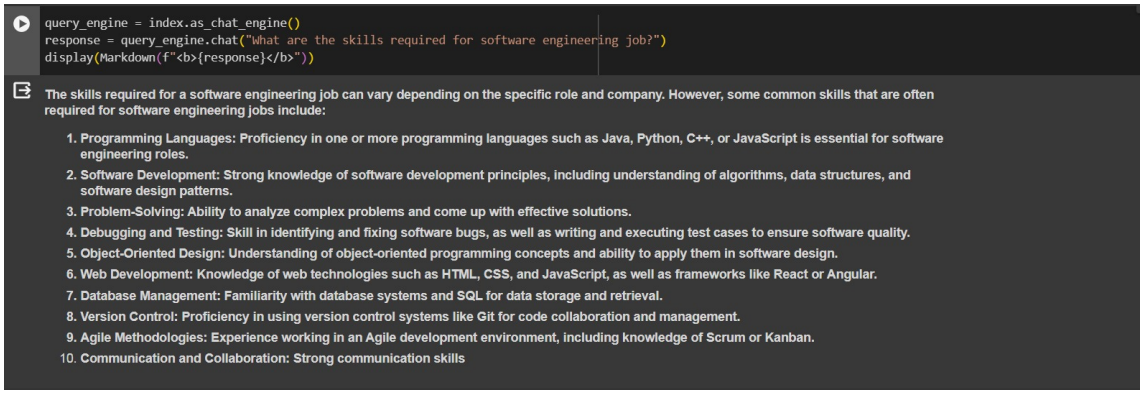


Figure 9.1: Testing Result1

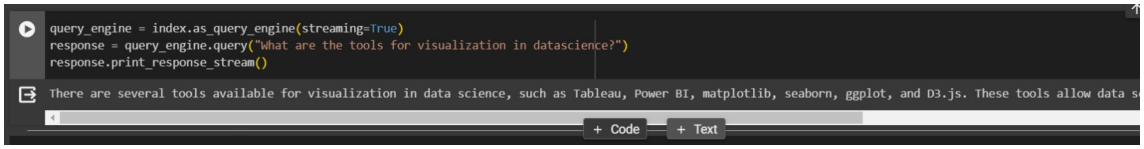


Figure 9.2: Testing Result2

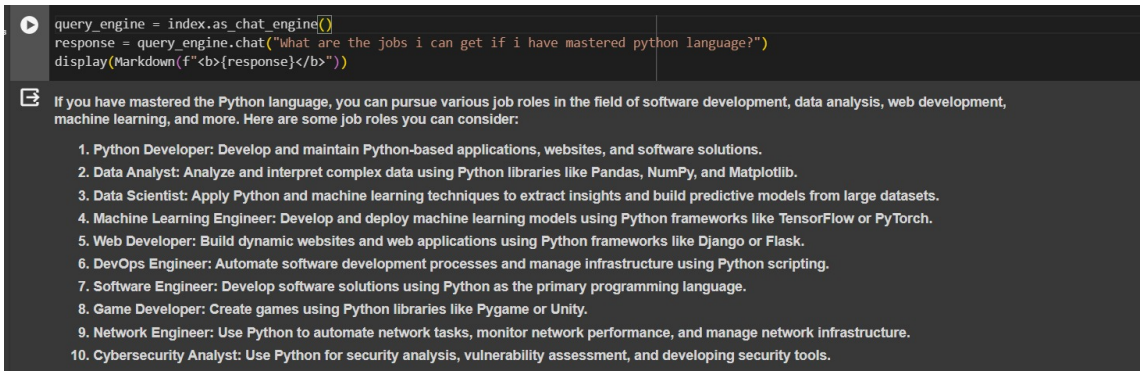


Figure 9.3: Testing Result3

9.2 User Registration

The signup page, which was outlined with user onboarding in intellect, has made the enlistment preparation straightforward and simple to utilize. We have a more proficient onboarding handle for our users much obliged to troublesome plan component choice and approval prepare execution. The user registration process is visualized in Figure 9.4

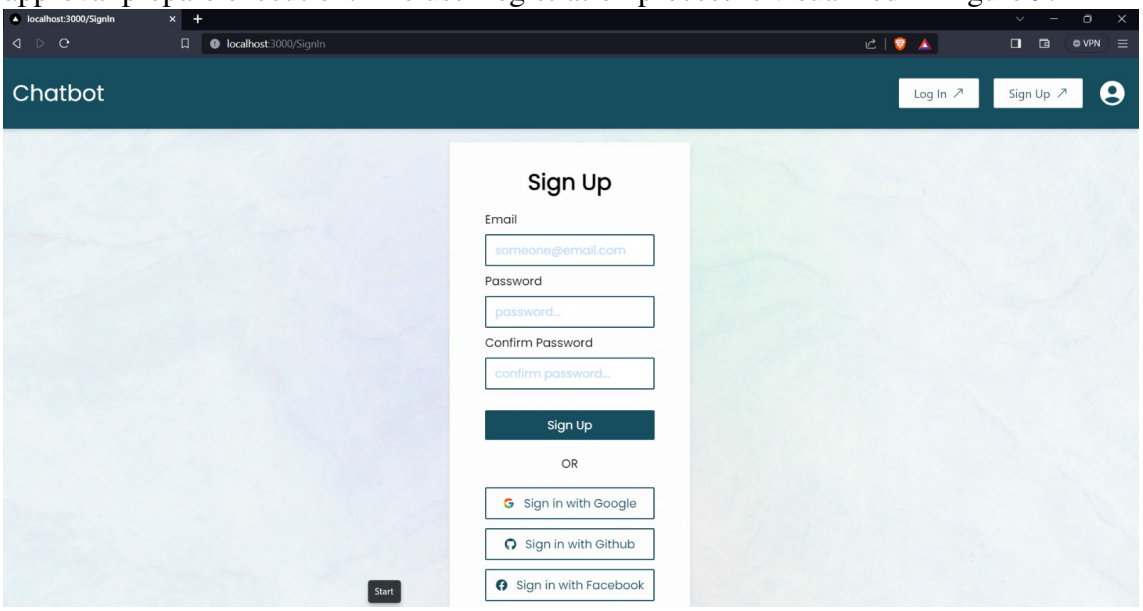


Figure 9.4: Sign up

9.3 User Authentication Success

Users presently have a secure and simple way to get to the chatbot much obliged to the login page's effective execution. Credential approval and other security highlights, together with user confirmation methods, have been demonstrated to be exceedingly reliable and compelling. The successful authentication process is visualized in Figure 9.5.

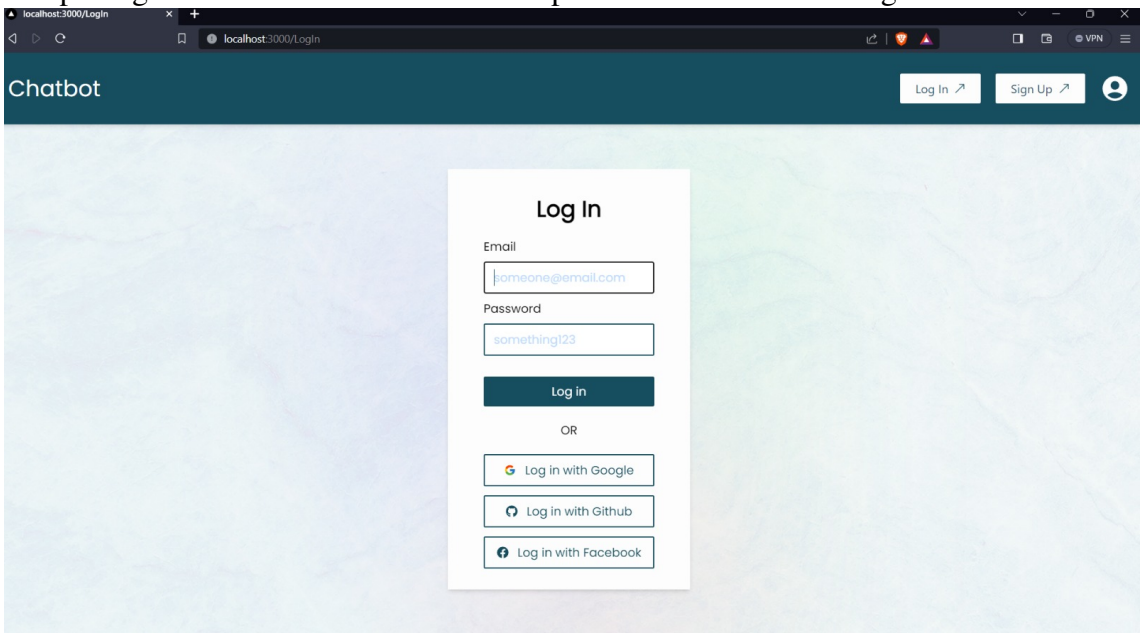


Figure 9.5: Sign up

9.4 The Welcome Page and User Communication

Users are coordinated to the Welcome Page, the center of our IT career guiding chatbot, after effectively logging in. This basic component acts as the section point to individualized and discerning career counseling. The Welcome Page, which was made with user-centric plan standards in intellect, skillfully combines convenience and fashion to supply a capturing user encounter. The Welcome Page serves as the command middle for user requests, advertising a way for individuals to investigate customized suggestions, take ability appraisals, and inquire questions about careers. The chatbot encourages a conversational and user-friendly interaction by scholarly people translating user input through the utilization of Characteristic Dialect Preparing (NLP) calculations. Users can characteristically inquire questions, and the chatbot will reply with counsel and bits of knowledge that are relevant. The welcome page presentation is captured in Figure 9.6.

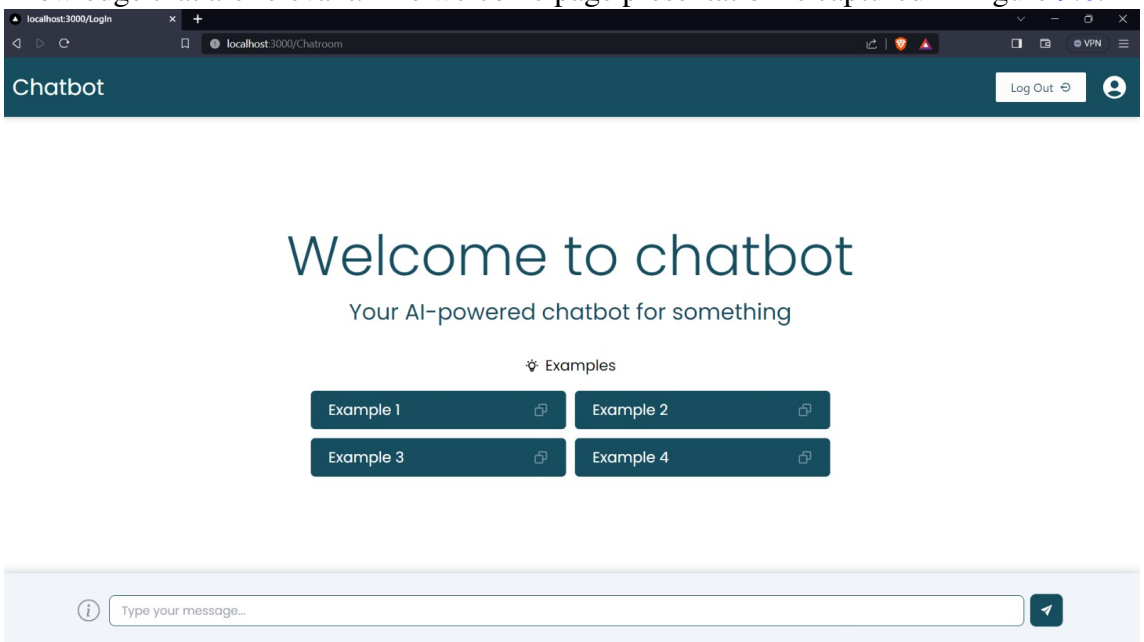


Figure 9.6: Welcome

9.5 Chatbot Dashbord

Users are coordinated to the Dashboard, the energetic center of our IT career counseling chatbot, after they have effectively logged in. With an assortment of devices to enable and help individuals in their career investigation, this page capacities as the most important asset for user exploring their proficient travel. The dashboard for the chatbot is illustrated in Figure 9.7.

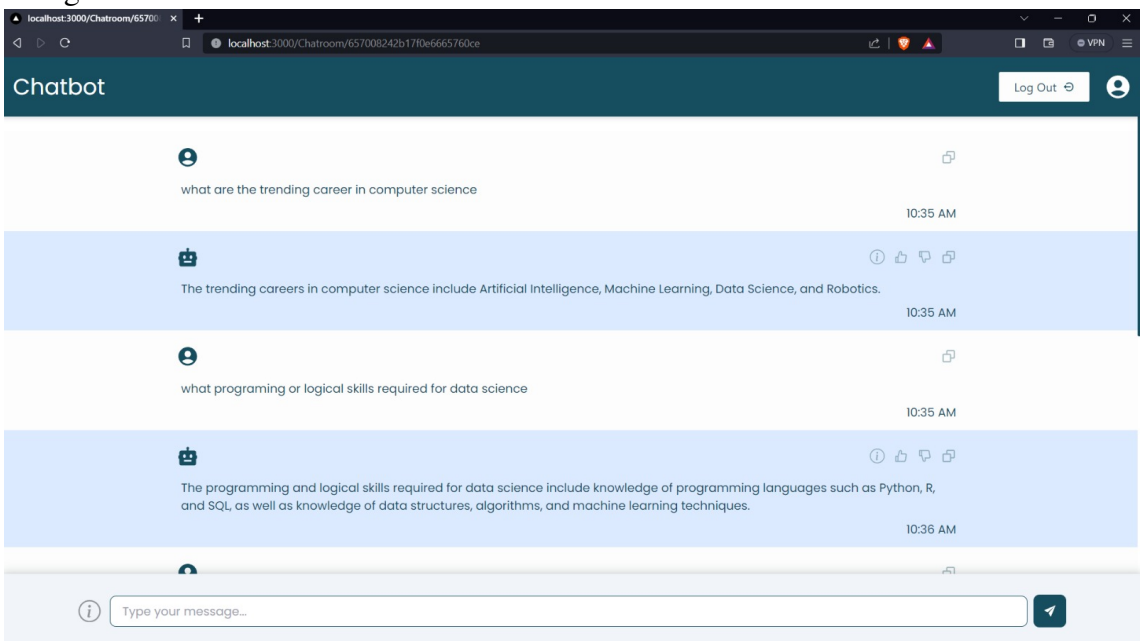


Figure 9.7: Dashboard

Chapter 10

Implementation Details

10.1 Natural Language Processing (NLP)

Make it conceivable for the chatbot to comprehend user asks and reply in a typical dialect.

Tokenization needs to be utilized to segment user input into important chunks.

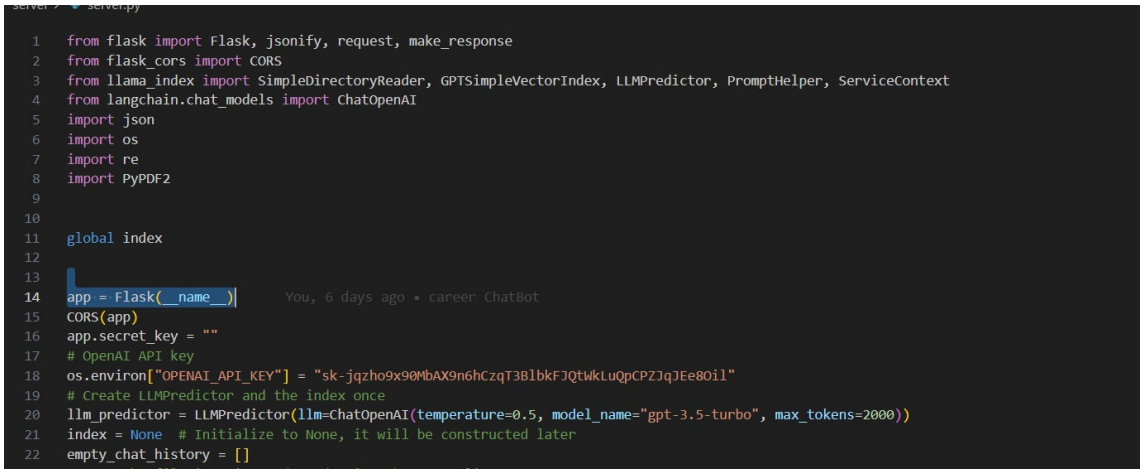
To recognize substances such as developments, work parts, and capacities, utilize Named Substance Affirmation (NER).

10.2 Industry Insights in Real Time

Instruct users on the preeminent later progressions and designs inside the IT division.

Utilize web scratching calculations to initiate up-to-date information from strong sources inside the industry.

Make utilize of ordinary lingo taking care of to condense and responsively allow industry bits of information.



```python
from flask import Flask, jsonify, request, make_response
from flask_cors import CORS
from llama_index import SimpleDirectoryReader, GPTSimpleVectorIndex, LLMPredictor, PromptHelper, ServiceContext
from langchain.chat_models import ChatOpenAI
import json
import os
import re
import PyPDF2


global index


app = Flask(__name__)      You, 6 days ago • career ChatBot
CORS(app)
app.secret_key = ""
# OpenAI API key
os.environ["OPENAI_API_KEY"] = "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"
# Create LLMPredictor and the index once
llm_predictor = LLMPredictor(llm=ChatOpenAI(temperature=0.5, model_name="gpt-3.5-turbo", max_tokens=2000))
index = None  # Initialize to None, it will be constructed later
empty_chat_history = []
```

Figure 10.1: code snippet1

Chapter 11

Conclusions and Future Work

11.1 In Summery

To whole up, the creation and sending of the chatbot for IT career directing speaks to a critical headway within the field of redone career counsel. After effectively coordinating of highlights like customized suggestions, user engagement apparatuses, and a login/signup framework, our chatbot has become a priceless important apparatus for individuals exploring the complex world of IT careers.

Our venture has not as it were accomplished its starting objectives, but moreover surpassed them, advertising user a smooth and instructive encounter. The integration of characteristic dialect preparing (NLP) calculations has empowered the chatbot to comprehend user requests and give shrewd and instinctive reactions. The pages for marking sign up and logging in offer assistance to form a secure and redone user involvement that makes user feel comfortable and interested.

Positive user feedback from testing phases has confirmed that the chatbot is effective at providing pertinent career advice. Users have been encouraged to actively participate in their career development by the Dashboard's progress tracking feature, which has improved and enhanced the user experience.

Even with our accomplishments, we understand that this is only the start of our journey. We acknowledge the difficulties encountered and the knowledge gained during the

project's duration as we think back on it. The IT industry's dynamic nature necessitates constant improvement and adaptation.

11.2 Upcoming Projects

Future development and improvements could focus on the following areas to further establish the chatbot's position as a top resource for IT career counseling

Improve algorithms to provide skill evaluations and career recommendations that are more accurate. Continued usability testing should be used to optimize the user interface. Including Cutting-Edge Technologies. Examine how to incorporate more sophisticated NLP models for more complex user interactions. Examine how machine learning can be applied to the analysis of industry trends in real time. Optimization of User Experience by creating individualized learning pathways to accommodate a range of user preferences and ensure inclusively by improving accessibility features. By increasing the Knowledge Base we will Update the knowledge base frequently to reflect new developments in technology and industry trends. Examine collaborating with industry leaders to improve the counsel provided by the chatbot. Including Moral Considerations Put procedures in place to deal with response bias and guarantee justice. Boost user privacy safeguards and openness in data processing.

Examine creating mobile apps and integrating them with well-known messaging services. Make sure all platforms work together seamlessly to reach a larger user base. Working Together with Sector Expert Form partnerships with experts in the field to ensure ongoing validation and enhancement. Utilize outside insights to keep abreast of developments in the industry.

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