

# JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTER

Jaipur, RAJASTHAN

**A PROJECT REPORT**

**For**

**Summer Internship Program**

**Submitted in partial fulfilment for the  
INTERNSHIP**



**MASTER OF COMPUTER APPLICATION  
2022-24**

**Submitted to Department of Computer Application:  
Guide**

**SAMEEKSHA AGARWAL**

**Submitted by :**

**22MCAN220**

**PRADEEP SAINI**



# ZENOP TECHNOLOGIES

**SUBJECT:**

Internship Offer

**DATE:**

09 June, 2023


**Dear Pradeep Saini,**

We are delighted to inform you that you have been selected for an internship as a Backend Developer with Zenop Technologies' openagent division, located in Bangalore. Congratulations on this achievement!

Your start date is June 10th, and the internship will last for a period of 8 weeks. All of us at Zenop are excited that you will be joining our team. The project details and technical platform will be shared with you on or before June 10th, 2023.

Once again, congratulations, and we look forward to working with you.

**Sincerely,**

DocuSigned by:  
  
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**Anurag Bisoyi**  
CEO

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8861-280-063

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81, Shree Sai Layout , BLR-100



# CERTIFICATE OF INTERNSHIP

This internship program certificate is  
proudly awarded to

**PRADEEP SAINI**

For his exemplary performance during the Summer  
internship at Zenop Technologies from June 12th to  
August 12th.

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CEO & Founder

**Anurag Bisoyi**

# Acknowledgement

I, Pradeep Saini (MCA Sunstone) would like to convey my gratitude to the Zenop Technologies for emphasizing on the 2- months Summer Internship Program and giving me the platform to interact with industry professionals.

I would also like to thank Mr. Anurag bisoi Sir Ceo of Zenop technologies for giving me the opportunity to work on the DotAgent Framework. I am thankful to the entire project team for their guidance and support throughout the internship, which contributed significantly to the successful completion of the DotAgent Framework project.

I extend my warm gratitude and regards to everyone who helped me during my internship.

# **Executive Summary**

During the summer of 2023, I had the opportunity to work as a Backend Developer Intern at Zenop Technologies. This internship provided me with a valuable learning experience, enabling me to contribute to the development of an innovative project called "DotAgent ." Over the Internship of two months, I actively participated in the design, development, and testing of this multiagent system aimed at optimizing AI solutions. This project report provides an in-depth overview of my internship experience and the contributions made to the DotAgent Framework.

# Company Overview

Zenop Technologies is a leading technology company located in Bangalore, specializing in AI and machine learning solutions. The company is committed to pushing the boundaries of AI technology to solve complex problems across various domains. My internship at Zenop Technologies allowed me to be part of a dynamic team of professionals dedicated to advancing AI research and development.

## Project Overview

Project Name: DotAgent

Project Duration: 2 Months

Role: Backend Developer Intern

## Project Objectives:

- **What Is DotAgent :**

Dotagent is a library of modular components and an orchestration framework. Inspired by a microservices approach, it gives developers all the components they need to build robust, stable & reliable AI applications and experimental autonomous agents.

- **Features Of DotAgent:**

1. **Modularity**

**Multiplatform:** Agents do not have to run on a single location or machine. Different components can run across various platforms, including the cloud, personal computers, or mobile devices.

**Extensible:** If you know how to do something in Python or plain English, you can integrate it with dotagent.

2. **Guardrails**

**Set clear boundaries:** Users can precisely outline what their agent can and cannot do. This safeguard guarantees that the agent remains a dynamic, self-improving system without overstepping defined boundaries.

- 3 . **Greater control with Structured outputs**

**More Effective Than Chaining or Prompting:** The prompt compiler unlocks the next level of prompt engineering, providing far greater control over LLMs than few-shot prompting or traditional chaining methods.

**Superpowers to Prompt Engineers:** It gives full power of prompt engineering, aligning with how LLMs actually process text. This understanding enables you to precisely control the output, defining the exact response structure and instructing LLMs on how to generate responses.

## 4. Powerful Prompt Compiler

The philosophy is to handle more processing at compile time and maintain better session with LLMs.

Pre-compiling prompts: By handling basic prompt processing at compile time, unnecessary redundant LLM processing are eliminated.

Session state with LLM: Maintaining state with LLMs and reusing KV caches can eliminate many redundant generations and significantly speed up the process for longer and more complex prompts. (only for opensource models)

Optimized tokens: Compiler can transform many output tokens into prompt token batches, which are cheaper and faster. The structure of the template can dynamically guide the probabilities of subsequent tokens, ensuring alignment with the template and optimized tokenization . (only for opensource models)

Speculative sampling (WIP): You can enhance token generation speed in a large language model by using a smaller model as an assistant. The method relies on an algorithm that generates multiple tokens per transformer call using a faster draft model. This can lead to upto 3x speedup in token generation .

## 5. Containerized & Scalable

files : Agents can be effortlessly exported into a simple .agent or .py file, allowing them to run in any environment.



Agentbox (optional): Agents should be able to optimize computing resources inside a sandbox. You can use Agentbox locally or on a cloud with a simple API, with cloud agentbox offering additional control and safety.

## How To Access This Project :

It is Freely available For all You can access from This link:

<https://github.com/dot-agent/dotagent>

To use This project must sure We have Python in our system and use the following commands to run this application :

## Installation

### Step 1: Install Poetry

Poetry is used for dependency management in this project. Please note that Poetry has some compatibility issues with Conda.

```
pip install poetry
```

### Step 2: Lock the Dependencies

```
poetry lock
```

## Step 3: Install the Dependencies

```
poetry install
```

## Common Errors

### SQLite3 Version Error

If you encounter an error like:

Your system has an unsupported version of sqlite3. Chroma requires sqlite3 >= 3.35.0.

This is a very common issue with Chroma DB. You can find instructions to resolve this in the [Chroma DB tutorial](#).

## Code for a full-stack chat app, complete with UI.

```
import dotagent.compiler as compiler
from dotagent.compiler._program import Log
from dotagent import memory
import chainlit as ui
from dotenv import load_dotenv
load_dotenv()

@ui.on_chat_start
def start_chat():
    compiler.llm = compiler.llms.OpenAI(model="gpt-3.5-turbo")

class ChatLog(Log):
    def append(self, entry):
        super().append(entry)
        print(entry)
        is_end = entry["type"] == "end"
        is_assistant = entry["name"] == "assistant"
        if is_end and is_assistant:
            ui.run_sync(ui.Message(content=entry["new_prefix"]).send())

memory = memory.SimpleMemory()

@ui.on_message
async def main(message: str):
    program = compiler(
        """
        {{#system~}}
        You are a helpful assistant
        {{~/system~}}

        {{~#generate 'conversation' stop=False}}
        {{#user~}}
        {{set 'this.user_text' (await 'user_text') hidden=False}}
        {{~/user~}}
        """
    )
```

```

{{#assistant~}}
{{gen 'this.ai_text' temperature=0 max_tokens=300}}
{{~/assistant}}
{{~/geneach}}""", memory = memory
)

program(user_text=message, log=ChatLog())

```

## Output ScreenShot :

<b>User</b> 09:19:38	hi . tell me about delhi
<b>Chatbot</b> 09:19:48	<p>&lt; im_start &gt;assistant</p> <p>Delhi is the capital city of India and is located in the northern part of the country. It is one of the oldest cities in the world, with a rich history dating back thousands of years. Delhi has been the seat of power for various empires and dynasties, including the Mughals, the British, and now the Indian government.</p> <p>The city is known for its diverse culture, vibrant markets, and historical landmarks. Some of the popular tourist attractions in Delhi include the Red Fort, Qutub Minar, India Gate, Jama Masjid, Humayun's Tomb, and Lotus Temple. These architectural marvels showcase the city's rich heritage and attract visitors from all over the world.</p> <p>Delhi is also a major political, economic, and cultural hub. It is home to numerous government institutions, multinational corporations, educational institutions, and cultural centers. The city offers a wide range of opportunities in various sectors, making it a popular destination for professionals and students alike.</p> <p>Delhi is known for its street food, which offers a variety of flavors and cuisines. From spicy chaat to mouth-watering kebabs, the city's culinary scene is diverse and delicious. Additionally, Delhi is also famous for its shopping markets, such as Chandni Chowk, Sarojini Nagar, and Connaught Place, where you can find everything from traditional handicrafts to modern fashion.</p> <p>However, like any other major city, Delhi also faces challenges such as traffic congestion, pollution,&lt; im_end &gt;</p>

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# Achievements and Learning

My internship at Zenop Technologies provided me with several valuable learning experiences and achievements, including:

1. **Technical Skills:** I gained practical experience in designing and developing a complex multiagent system using Python .
2. **Problem-Solving:** I learned to identify and resolve technical challenges and bugs during the development phase.
3. **Collaboration:** I worked effectively within a team of experienced developers, enhancing my collaborative skills.
4. **Documentation:** I developed the ability to create user-friendly documentation, ensuring that the project was well-documented for future users and developers.
5. **Presentation Skills:** I improved my ability to present complex technical concepts in a clear and concise manner.

# Conclusion

My summer internship at Zenop Technologies was a highly rewarding experience. I am proud to have contributed to the development of the DotAgent Framework, a multiagent system designed to optimize AI solutions. This internship not only allowed me to apply my technical skills but also provided a platform to learn from experienced professionals in the field. I look forward to applying the knowledge and experience gained during this internship to future projects and career opportunities in the field of AI and technology.