

A Report on the Project

J.A.R.V.I.S AI ASSISTANT

Created by :

Abdullah Habib

Email: habib.abdullah7239@gmail.com

LinkedIn: <https://www.linkedin.com/in/habib-abdullah7239/>

TABLE OF CONTENT

<u>S.No</u>	<u>Name</u>	<u>Page</u>
1.	LIST OF FIGURES	5
2.	ABSTRACT	6
3.	CHAPTER 1: INTRODUCTION	7
4.	CHAPTER 2: WHAT IS AI? HOW IT HELPS US?	9
5.	CHAPTER 3: THE NEED AND RISE OF AI ASSISTANTS	11
6.	CHAPTER 4: J.A.R.V.I.S AI ASSISTANT	13
7.	CHAPTER 5: CONCLUSION	18
8.	CHAPTER 6: FUTURE WORK	19
9.	REFERENCES	20

LIST OF FIGURES

Fig 1	Smart Manufacturing	7
Fig 2	Artificial Intelligence Robot	9
Fig 3	AI Algorithms	10
Fig 4	Virtual Assistants	11
Fig 5	ChatGPT Interface	12
Fig 6	Some Needed Packages for J.A.R.V.I.S	13
Fig 7	Block Diagram of J.A.R.V.I.S	14
Fig 8	J.A.R.V.I.S searching on Google	15
Fig 9	J.A.R.V.I.S playing music	15
Fig 10	J.A.R.V.I.S writes a poem	16
Fig 11	J.A.R.V.I.S informing the latest news	16
Fig 12	J.A.R.V.I.S on how to make a tea	17
Fig 13	J.A.R.V.I.S generating code as well as explaining what it does	17

ABSTRACT

This report highlights the fact that the industry is changing every day, and advancements are prioritized. We are currently living in the era of Industry 4.0 which has seen huge technological advancements over the years. Many human burdening tasks are now done by machines and soon will be done by robots. With the implementation of Artificial Intelligence (AI) everywhere, a future with machines and robots is inevitable. This report also reflects the use and need of AI in the current era. Furthermore, the use of AI in various domains and its applications with different algorithms. The need of AI Assistant has also been acknowledged as us humans with limited capabilities face a lot of challenges in our daily lives physically, mentally, and emotionally. AI Assistants and Chatbots have proven their worth in the industry to be one of the most productive and profitable inventions. This report also shows the implementation of the AI Assistant named “J.A.R.V.I.S” created by the author. It also discusses its capabilities and potential in the different industry as well as how it can be advanced further in the future.

CHAPTER 1 : INTRODUCTION

We are living in a generation where development has been prioritized to an epitome level to the point that the world is changing every minute. The vision of the world, society, has changed. Everyone is looking for a new upcoming development and how the next successive process defeats its predecessor. This development drive has hit almost every industry that exists where the Tech Industry has seen the most effect in this era.

There have been numerous advancements made and more huge changes are coming in the upcoming years. In addition, many non-tech industries are now equipping their arsenal with Tech to become more efficient and fast with their production. Practically, if a particular organization does not use technology in their process, they may not survive in the upcoming generations. No doubt, technology solves a lot of issues and is efficient in performing its task but, it has also resulted in many people being kicked out of their jobs because of so much development and advancements.



Fig 1: Smart Manufacturing

Figure 1 shows how the advancement in technology has led to the changes in the industry and things are smartly manufactured. We can see the difference in how the operations used to take place earlier versus how it is done now. It is multiplied times faster and more accurate, precise, and efficient.

Likewise, we have seen a lot of advancements in technology itself. One term that has been on the rise in today's generation is "Artificial Intelligence (AI)". Artificial Intelligence has not only changed the world, but also changed the perception of people about technology and how it works. Artificial Intelligence has become a very crucial part of every technology that is used at present. The invention of technology has already revolutionized our world to massive scales. The impact Artificial Intelligence has made is enormously larger as compared to previous inventions. We need to know what it is, how it works, how to implement it and more.

CHAPTER 2 : WHAT IS AI? HOW AI HELPS US?

Artificial Intelligence (AI) is defined as a simulation of human intelligence in machines that act as a human and are programmed to think and learn like them. It can perform each task assigned to it just like humans as well as learning from them. For such a system to exist, it requires human intelligence to be programmed in it.

Just like humans, a child is taught things by his or her parent or guardian. Then, the child implements it in his activities and learns from his experiences and situations. Similarly, we humans are the parent of machines, and we need to teach them human intelligence for them to work and learn like us.

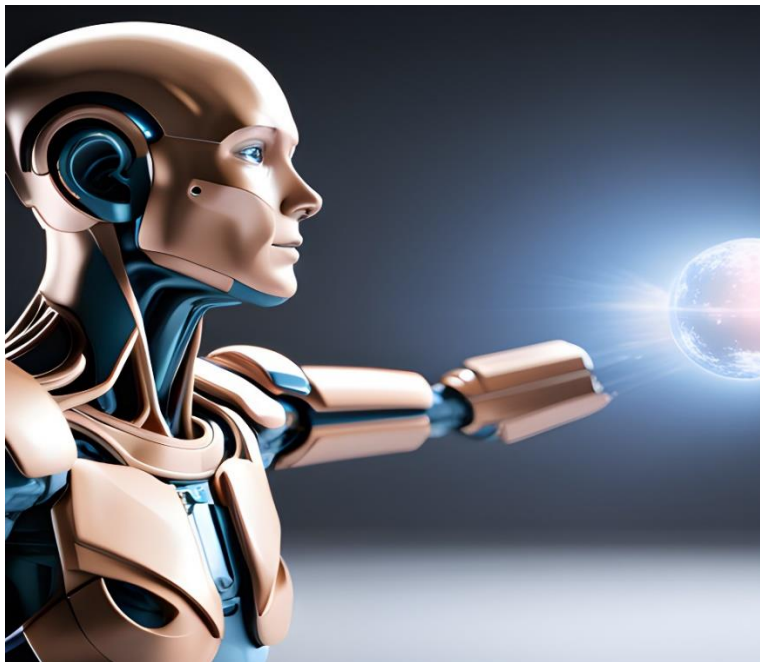


Fig 2: Artificial Intelligence Robot

As mentioned above, AI is the ability of a machine to do things like humans. The main aim of AI is to automate things for us where we have to give minimum effort and maximum productivity to save time and our energy. AI automates many tasks which can be done by humans. It has proven its worth in solving complex tasks and problems. Its response and replies are precise and accurate. It can also be used to predict future data and achieve accuracies as high as 99.99%. Although, all AI algorithms are data hungry but, data is not an issue in today's world.

There mostly 3 types of algorithms in AI :

- i. Classification
- ii. Clustering
- iii. Regression

The Figure 3 illustrates the some AI Techniques/Algorithms of different type.

Algorithm	Type	Problem Solution
SVM or Support Vector Machines	Classification & Regression	Used to predict categorical or continuous data outcome
Logistic Regression	Classification	Used to predict categorical solution
KNN or K-nearest-neighbor	Classification & Regression	Used to predict categorical or continuous data outcome
Decision Trees	Classification	Used to predict categorical solution
Deep Learning	Classification, Regression & Clustering	Used for complex problems prediction

Fig 3 : AI Algorithms

CHAPTER 3 : THE NEED AND RISE OF AI ASSISTANTS

As discussed in Chapter 2 about how AI achieves its tasks, one of its most important applications is Chatbots or Assistants. Many industries have seen a decline in providing the necessary services to customers. It is also hard for a human being to multi-task and collect data from customers and solve each of their problems individually. The following problems may arise due to the above problem: -

- i. Unsatisfied Customer
- ii. Organization Reputation Downfall
- iii. Business Shutdown or Failure
- iv. Burden on Employees
- v. Insufficient or Incorrect Data
- vi. Layoffs and Unemployment

As we see the rise in living standards and needs of people where everybody wants to save time, humans have limited capabilities and cannot be present to answer the queries of people or customers every time. However, there is a solution to this problem that is to use AI Assistants or Chatbots. AI Assistants or Chatbots give a huge advantage to any organization and solve most of the problems mentioned above. They are completely reliable for most cases scenarios.

With the integration of AI Assistants or Chatbots, the burden on employees has been significantly decreased as well as increased rate of satisfaction of the customer. It is also available 24x7 to answer any query of the customer. An AI Assistant can also be used for personalization experience which gives a modern atmosphere to its user. In fiction, we have practically become Tony Stark.



Fig 4: Virtual Assistants

In Figure 4, we can see the different virtual assistants that has been developed by different top-tier companies.

GPT (Generative Pre-Trained Transformer) are a series of large-language models which are powered by NLP (Natural Language Processing) was part of the Generative AI project of AI approach-driven company, OpenAI. In June 2018, the first GPT model was released that was able to generate relevant text according to the prompt by the user. Moving forward, they significantly upgraded over GPT-1 to GPT-2 which works on almost 1.5 billion parameters. Due to such an upgrade, the GPT model could generate more coherent and complex text. GPT-3 model got an upgrade to 175 billion parameters. GPT-3 could not only generate text, but it was indistinguishable whether the text was written by AI or human. GPT-3 achieved high accuracy and precision with its responses.

In Fall of 2022, OpenAI released ChatGPT (GPT-3.5 and now GPT-4) which revolutionized the chatbot and AI Assistant industry. ChatGPT was mainly designed with the purpose of Conversational and Generative AI combined in one. Many companies started integrating their work process with ChatGPT. ChatGPT also passed numerous aptitude tests including university level exams. Many other companies followed the invention of GPT-based chatbots like Google Bard, Microsoft Bing, and other AI tools for creation.

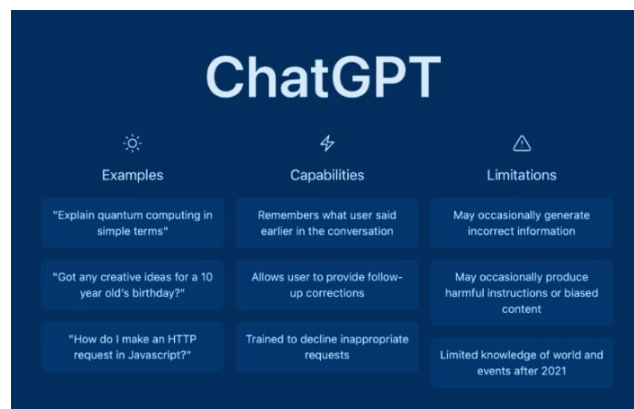


Fig 5 : ChatGPT Interface

GPT-based chatbot are being used immensely in today's generation. They are also now being used by medical professionals to provide more valuable healthcare services. In future, the use of AI Assistant and chatbots will increase as they add great value to the process and aid in working efficiently and saving time.

CHAPTER 4: J.A.R.V.I.S AI ASSISTANT

Keeping the above cases discussed in Chapter 3 and the importance of AI mentioned in Chapter 2, we have created a desktop assistant named “J.A.R.V.I.S”. J.A.R.V.I.S is a Chatbot and AI Assistant which anyone can be used with the necessary files on their system. Inspired by the discussion in Chapter 2, we have integrated GPT-based AI with J.A.R.V.I.S. It can do the most basic tasks like opening & closing the browser, telling the time. In addition, it can do advanced tasks like generative text, different prompts by user, etc.

Methodology Used: Python is considered the best and most readable, easy-to-understand programming language. Basic AI Algorithms like regression and classification tasks are also implemented in Python. For scalability purposes, we have used Python Virtual Environment so that there are no errors regarding package installation. For environment, we have used PyCharm IDE which provides a user-friendly UI and easy-to-use workspace. For GPT based tasks, we have used Google Bard API Framework. For some additional help (if needed), we can use ChatGPT.

Necessary Needed Packages: - These packages can be installed using “*pip install*” command.

Name	Version	Use
Speech Recognition	3.10.0	To capture command from microphone
Wikipedia	1.4.0	To search and get information from Wikipedia
Pytsx3	2.90	Converts text to speech
Pywhatkit	5.4	Can be used to play videos, send messages & more
playsound	1.2.2	Can be used to play any music or sound file
GoogleBard	1.4.0	Used for GPT based tasks

Fig 6: Some Needed Packages for J.A.R.V.I.S

Working :

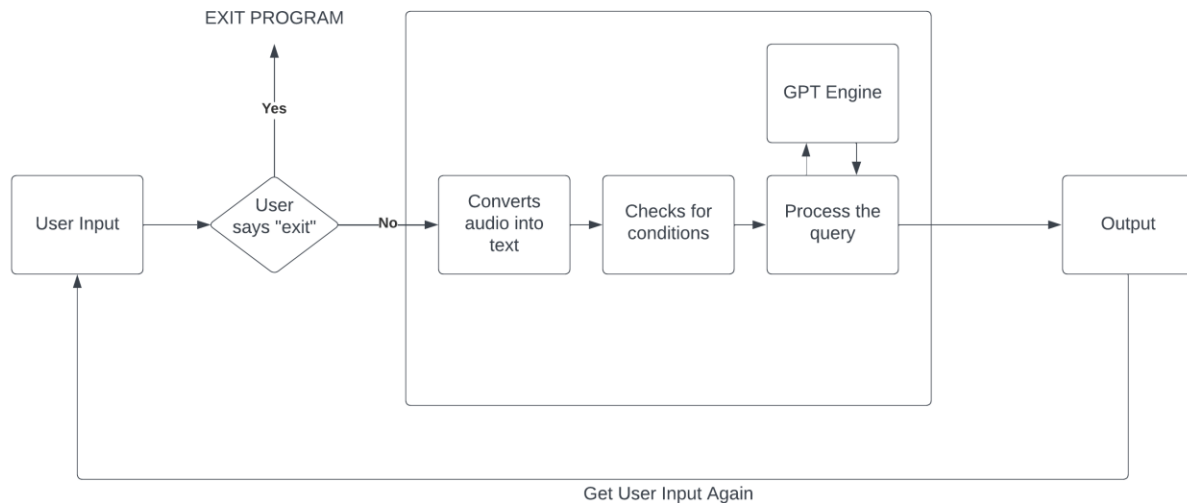


Fig 7: Block Diagram of J.A.R.V.I.S

Figure 7 explains the exact workflow procedure of how J.A.R.V.I.S operates in the form of a block diagram. The user audio input is taken by it using the default system microphone and is recognized by speech recognition library in Python and converted into text. Then the query is passed into a series of conditions to check whether it is a basic task or complex task. If it is a complex task, it is then passed to the GPT Engine powered by Google Bard and then J.A.R.V.I.S responds to the user. Another iteration begins as J.A.R.V.I.S looks for a new prompt or exit command that would exit the program completely.

1. Performing Search

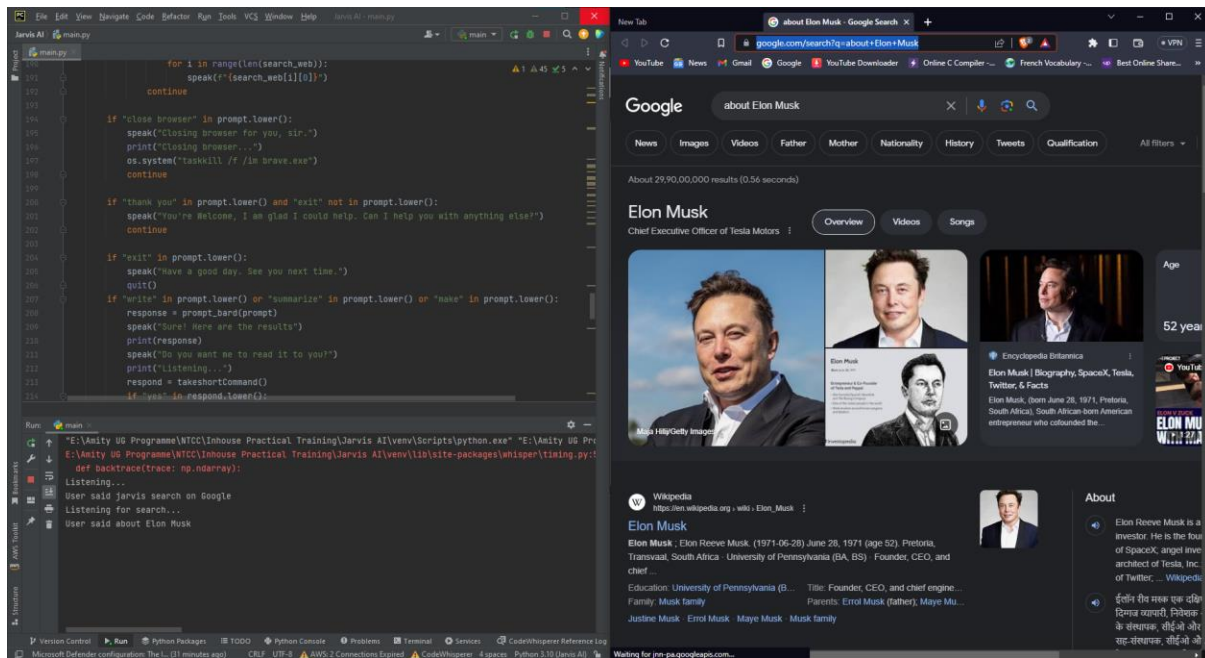


Fig 8: J.A.R.V.I.S searching on Google

2. Playing music (via YouTube)

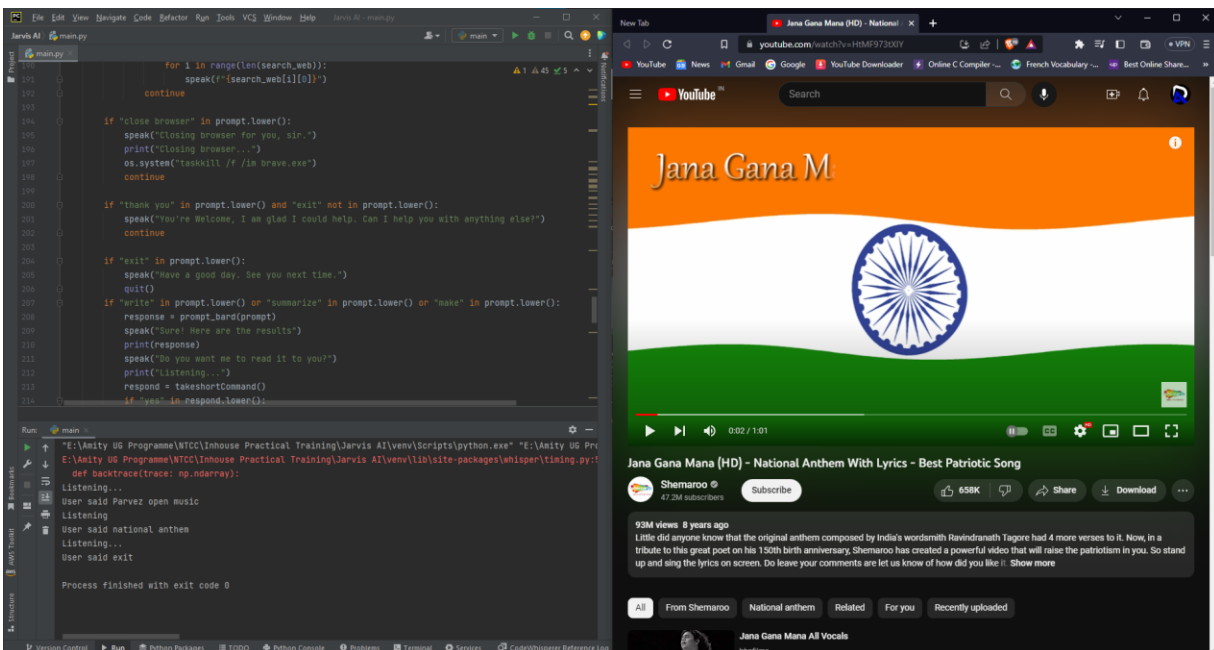
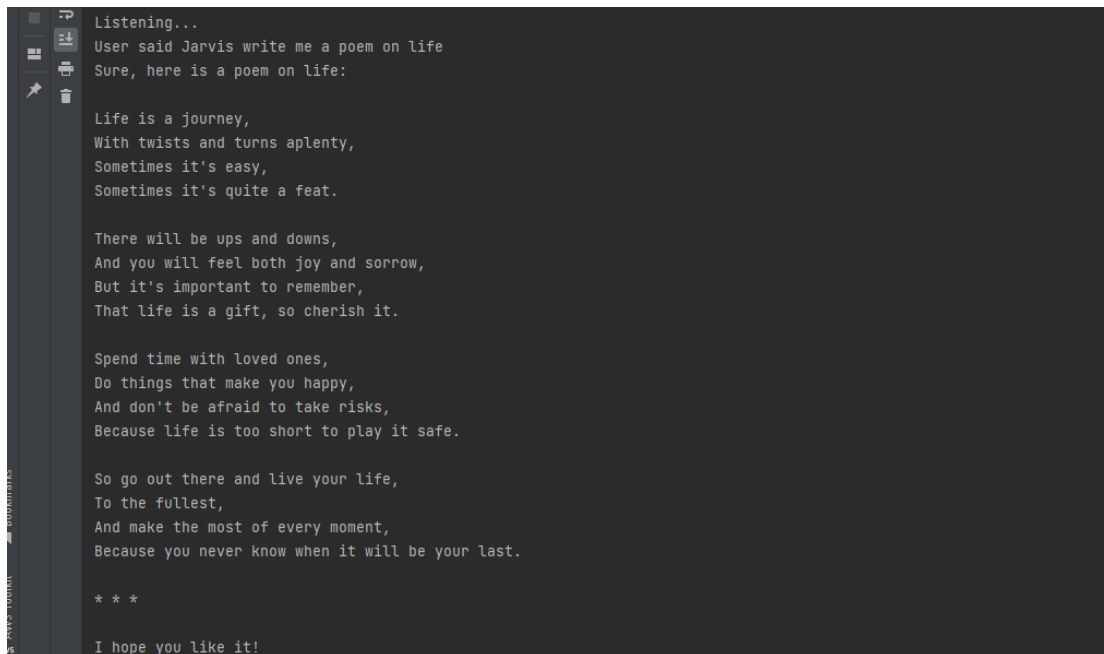


Fig 9: J.A.R.V.I.S playing music

3. Complex Task



```
Listening...
User said Jarvis write me a poem on life
Sure, here is a poem on life:

Life is a journey,
With twists and turns aplenty,
Sometimes it's easy,
Sometimes it's quite a feat.

There will be ups and downs,
And you will feel both joy and sorrow,
But it's important to remember,
That life is a gift, so cherish it.

Spend time with loved ones,
Do things that make you happy,
And don't be afraid to take risks,
Because life is too short to play it safe.

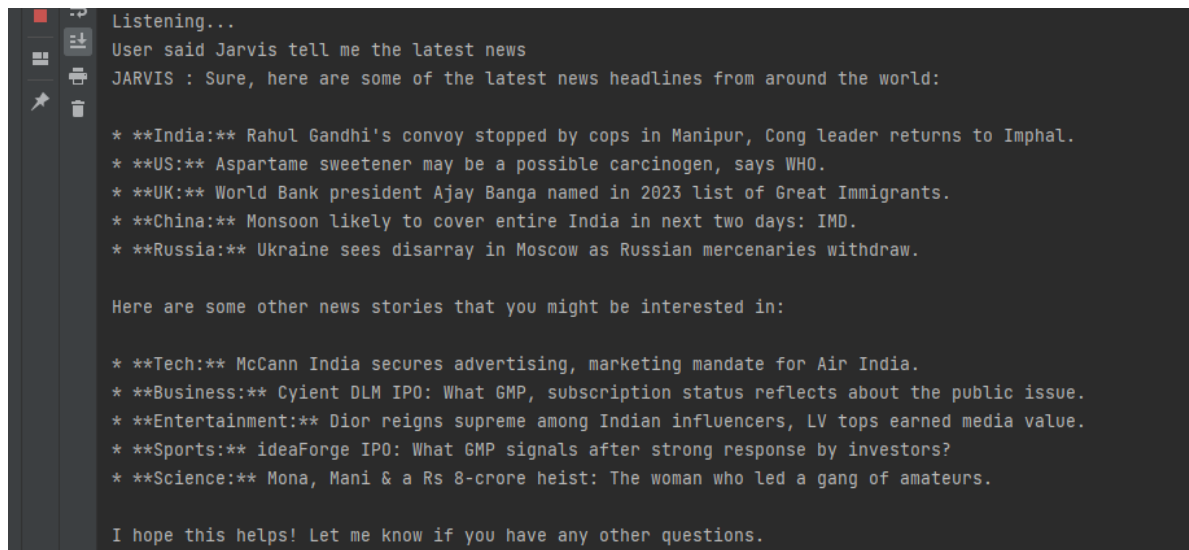
So go out there and live your life,
To the fullest,
And make the most of every moment,
Because you never know when it will be your last.

* * *

I hope you like it!
```

Fig 10: J.A.R.V.I.S writes a poem

4. Communicating the latest news



```
Listening...
User said Jarvis tell me the latest news
JARVIS : Sure, here are some of the latest news headlines from around the world:

* **India:** Rahul Gandhi's convoy stopped by cops in Manipur, Cong leader returns to Imphal.
* **US:** Aspartame sweetener may be a possible carcinogen, says WHO.
* **UK:** World Bank president Ajay Banga named in 2023 list of Great Immigrants.
* **China:** Monsoon likely to cover entire India in next two days: IMD.
* **Russia:** Ukraine sees disarray in Moscow as Russian mercenaries withdraw.

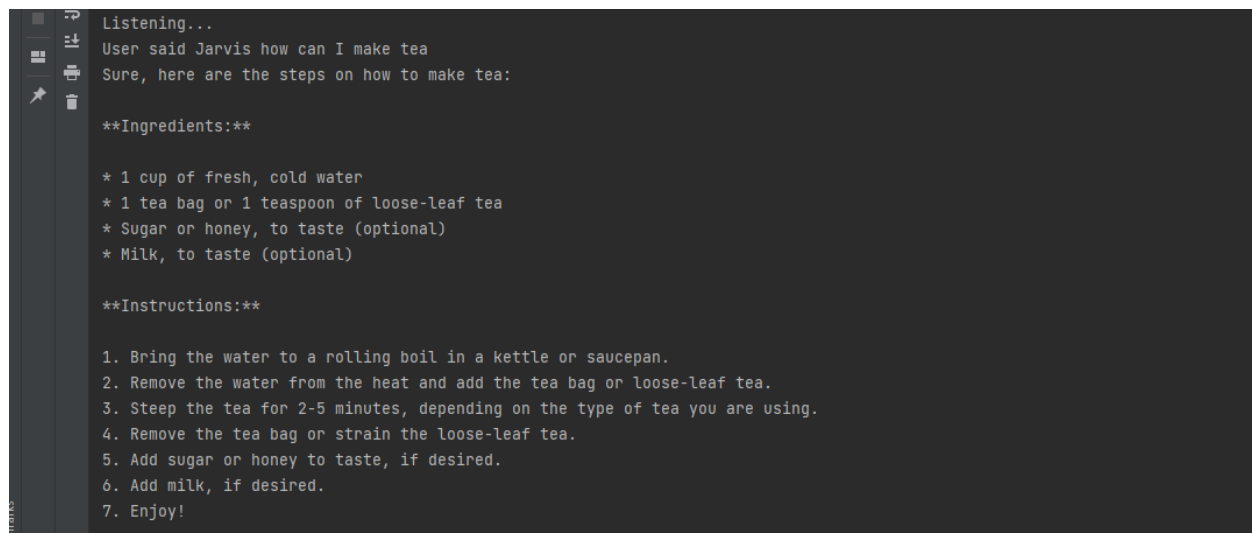
Here are some other news stories that you might be interested in:

* **Tech:** McCann India secures advertising, marketing mandate for Air India.
* **Business:** Cyient DLM IPO: What GMP, subscription status reflects about the public issue.
* **Entertainment:** Dior reigns supreme among Indian influencers, LV tops earned media value.
* **Sports:** ideaForge IPO: What GMP signals after strong response by investors?
* **Science:** Mona, Mani & a Rs 8-crore heist: The woman who led a gang of amateurs.

I hope this helps! Let me know if you have any other questions.
```

Fig 11: J.A.R.V.I.S informing the latest news

5. User query response



```
Listening...
User said Jarvis how can I make tea
Sure, here are the steps on how to make tea:

**Ingredients:**

* 1 cup of fresh, cold water
* 1 tea bag or 1 teaspoon of loose-leaf tea
* Sugar or honey, to taste (optional)
* Milk, to taste (optional)

**Instructions:**

1. Bring the water to a rolling boil in a kettle or saucepan.
2. Remove the water from the heat and add the tea bag or loose-leaf tea.
3. Steep the tea for 2-5 minutes, depending on the type of tea you are using.
4. Remove the tea bag or strain the loose-leaf tea.
5. Add sugar or honey to taste, if desired.
6. Add milk, if desired.
7. Enjoy!
```

Fig 12: J.A.R.V.I.S on how to make a tea

6. Code Generation



```
Listening...
User said write me a Python program to add two numbers
Sure, here is a Python program to add two numbers:

'''python
def add_numbers(x, y):
    """Adds two numbers together.

    Args:
        x: The first number to add.
        y: The second number to add.

    Returns:
        The sum of x and y.
    """

    return x + y

if __name__ == "__main__":
    print(add_numbers(10, 20))
...

This program first defines a function called 'add_numbers()'. This function takes two numbers as input and returns the sum of the two numbers. The function is then

To run this program, you can save it as a Python file and then run it from the command line. For example, if you save the program as 'add_numbers.py', you can run :
```

Fig 13: J.A.R.V.I.S generating code as well as explaining what it does

CHAPTER 5 : CONCLUSION

We have seen the overall benefit of how integrating any machine or software with AI multiplies its capabilities. This report explains very well why we require AI Assistants and has implemented one named J.A.R.V.I.S. Assistants like J.A.R.V.I.S will not only help the world to get their queries answered but also save time and reduce the workload on humans. Such systems can be implemented in any industry as per wish. In addition, it is expandable, scalable, and reliable as per the needs of the system where it is being implemented at. J.A.R.V.I.S was made with the idea that people may use it for general purposes. But it can also be personalized for any user by changing and adding extra lines of code. This project is also scalable as a Web Application and can be integrated with websites for clients to use.

CHAPTER 6: FUTURE WORK

J.A.R.V.I.S is just one AI Assistant with sound capabilities, but we can imagine the impact a large-scale J.A.R.V.I.S implementation would have in our industry. It can be expanded in various applications such as the medical industry would benefit a lot with an assistant like J.A.R.V.I.S. We can add visualization modules and use libraries like Face Recognition to add the functionality of visual detection. J.A.R.V.I.S has already been combined with a GPT Engine powered by Google Bard, it can also be combined with a neural network to make future predictions and help us plan our future better.

REFERENCES

- Nuria Haristiani (2019)– “*Artificial Intelligence (AI) Chatbot as Language Learning Medium: An inquiry*” [Journal of Physics : Conference Series 1387 012020]
- Naz Albayrak et al. (2018)– “*An overview of artificial intelligence based chatbots and an example chatbot application*” [IEEE Xplore Paper No: 8404430]
- Rabin Joshi et al. (2023) – “*Personal A.I. Desktop Assistant*” [International Journal of Information Technology, Research and Applications (IJITRA) Issue No- 2583 5343]
- Vibhor Sharma et al. (2017)– “*An Intelligent Behavior Shown by Chatbot System*” [International Journal of New Technology and Research (IJNTR) Volume-3, Issue-4]
- Menal Dahiya (2017)– “*A Tool of Conversation: Chatbot*” [International Journal Of Computer Sciences and Engineering, ResearchGate]
- Tarun Lalwani et al. (2018)– “*Implementation of a Chatbot System using AI and NLP*” [International Journal of Innovative Research in Computer Science and Technology(IJIRCST) Volume-6, Issue-3]
- Ashutosh Sakharkar et al (2021)- “*Python Based AI Assistant for Computer*” [International Research Journal of Engineering and Technology(IRJET) Volume-8, Issue-4]
- Vishal Kumar Dhanraj et al. (2022) – “*Research Paper on Desktop Voice Assistant*” ” International Journal Of Computer Sciences and Engineering (IJCSE) Volume-10, Issue-2
- Geetha v et al. (2021)– “*The Voice Enabled Personal Assistant for PC using Python*” ” International Journal of Engineering and Advanced Technology (IJEAT)
- Raj Kumar Jain et al. (2021)– “*Artificial Intelligence Based a Communicative Virtual Voice Assistant Using Python & Visual Code Technology*” [World Journal of Research and Review (WJRR) Volume-13, Issue-5]