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Research Paper onDesktop Voice Assistant

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Abstract:-
The main goal of Artificial intelligence (AI) is the realization of natural dialogue between humans and machines. There are many IT companies have used the dialogue systems technology to establish various kinds of Virtual Personal Assistants (VPAs) based on their applications and areas for increasing interaction between human and machine, such as Microsoft's Cortana, Apple's Siri, Amazon Alexa, Google Assistant. As like Microsoft cortana we have created our own virtual personal assistant only for windows using python which is able to access on any windows explorer such as windows 7,8,10. We use python as a programming language because it have a major libraries which is use to execute commands. By using python installer packages our personal virtual assistant recognize the user voice and process on it.
Voice assistants are the great innovation in the field of AI that can change the way of living of the people in a different manner. The voice assistant was first introduced on smartphones and after the popularity it got. It was widely accepted by all. Initially, the voice assistant was mostly being used in smartphones and laptops but now it is also coming as home automation and smart speakers. Many devices are becoming smarter in their own way to interact with human in an easy language. The Desktop based voice assistant are the programs that can recognize human voices and can respond via integrated voice system. This paper will define the working of a voice assistants, their main problems and limitations. In this paper it is described that the method of creating a voice assistant without using cloud services, which will allow the expansion of such devices in the future

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I. Introduction:-

Virtual assistant is used to run machine like laptop or PC's on your own command. Virtual assistant is an application program that understands natural language and voice commands to complete tasks for the users.
The Users can ask their assistants' questions, control home automation devices, and media playback viavoice,andmanageotherbasictaskssuchasemail, to-do lists, open or close any application, send messages to anyone on Whatsapp etc. with verbal commands only. Some other types of Voice Assistantare:

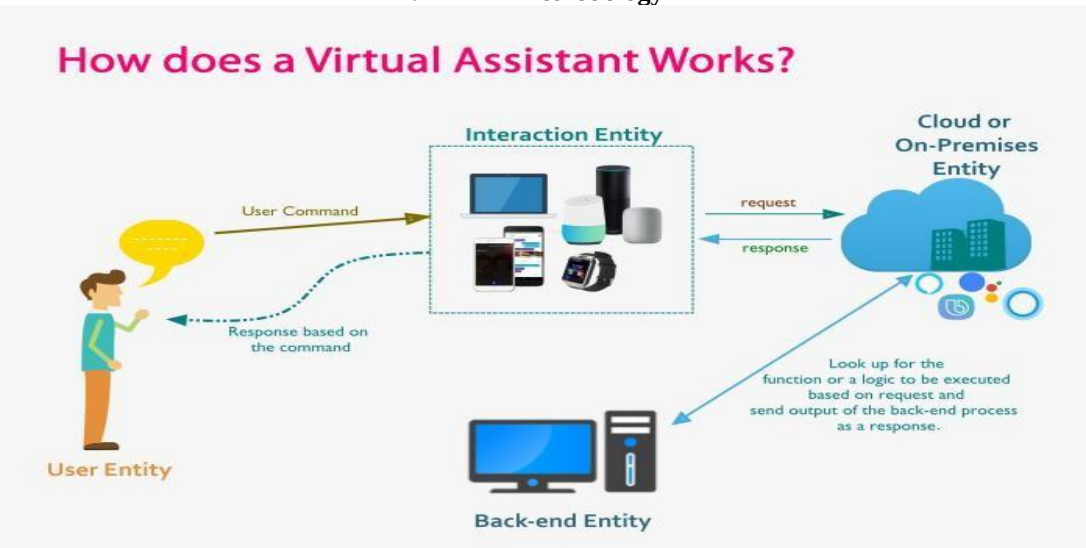
- IntelligentPersonalAssistant
- AutomatedPersonalAssistant
- VirtualDigitalAssistants
- Chat bot

Nowadays virtual assistant is very useful to human. It makes human life easier like operate PC's or laptop on only voice command. Virtual assistant is a less time consuming. By using virtual assistant we saves our time and contribute in other works. Virtual assistants are typically cloud-based program that requires internet connected devices. Virtual assistant is the flexibility to contract for just the services they need. For creating virtual assistant for your computer go from basics python. Virtual assistants are task-oriented. Virtual assistant's ability to understand and perform requests. Virtual assistants is a software that understands verbal and written commands and completes task assigned by clients. Virtual assistants are able to interpret human speech and respond via synthesized voices. There are several voice assistants in market like Siri for apple TV remote, Google Assistant for pixel XL smartphones, Alexa as a smart speaker which is developed by using Raspberry Pi, Microsoft Cortana for windows 10. As like this all virtual assistants we also created a virtual assistant for windows. We use Artificial Intelligence technology for this project. Also use python as a programming language, because python offers a good major libraries. For thissoftware use microphone as input device to receive voice requests from

user and speaker as output device to give the output voice. This process is the combination of several different technologies like voice recognition, voice analysis and language processing. Virtual assistant use Natural Processing language to match user text or voice input to executable commands. When a user give a command to personal virtual assistant to perform a task, the natural language is convertedtheaudio signals into digital signals Virtualassistantscanprovideseveralserviceswhichincludes,

- Showingweathercondition.
- Schedulingappointment.
- Makingtravellingarrangements.
- Playmusic,movies, etc.
- Showingdate-time.
- Managingemails.
- Openapps.

II. Methodology



Virtual assistants use NLP to match user text or voice input to executable commands. When a user asks a question to personal assistant to perform a task, then natural language audio signal is converted into executable command or digital data that can be analyzedby the software. Then this data is compared with a data of the software to find a suitable answer.VirtualAssistant is used to run machines on your own commands. For making virtual assistant we use some python installer packages like-

1) Speech recognition

The system is using Google's online speech recognition system for converting speech input to text. Through this the users can speak and obtain the text in exchange of voice input from the special corpora organized on computer network server at the information center from the microphone which is temporarily stored in the system and then sent to google cloud for speech recognition. The same text is then received and sent to the voice assistant program.

2) Python Backend

The whole program is written on python Backend. The python Backend work on getting the output in exchange of voice input provided by the users through speech recognition module and then identifies whether the command given is Context Extraction, API Call and System call. The response is then sent back to give required output.

3) API calls

Application Programming Interface is software intermediatory and the work of the API is to allow two applications to talk each other. In other words, API is the message passer that delivers the users request to the provider and then send the response back to users.

4) Content Extraction

Context Extraction is use to automatically extract structured information from unstructured or semi-structured machine-readable documents. This task uses natural language processing (NLP) for processing human language texts. Activities like automatic annotation and content extraction out different images/video/audio could be seen as content extraction.

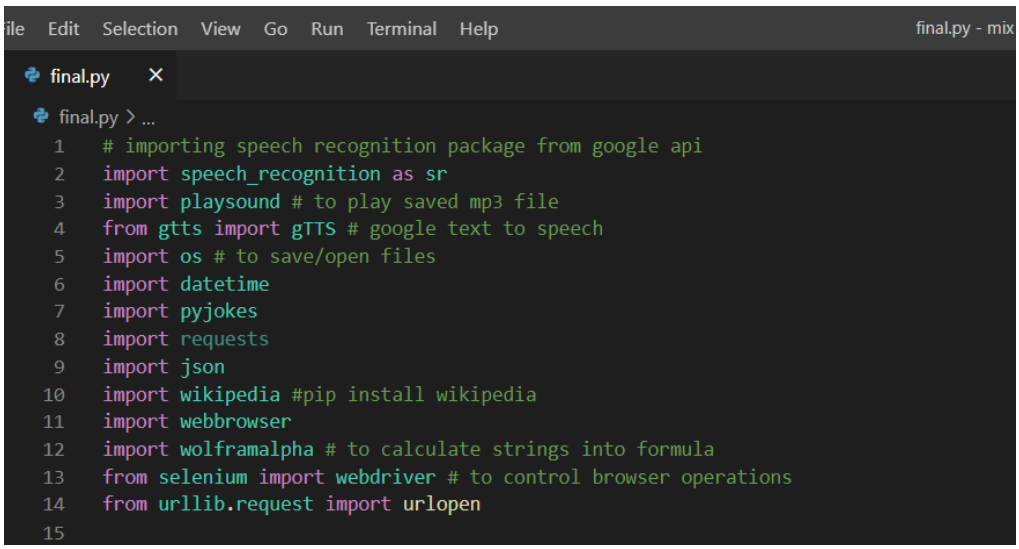
5) System Calls

In System Calls a programmatic approach takes place in which a computer program requests a service from kernel of the OS it is executed on, which may include functions related to hardware services for example, accessing hard disk drive, creation and execution of new processes and communication with process scheduling. It provides an important interface between the process and the OS.

6) Google-Text-to-Speech

Text-To-Speech is basically used for conversion of Speech from Text provided by the user. In other words, a TTS Engine Converts written form of text into phonemic representation, then converts the phonemic representation to waveforms which results in sound. TTS has developed a lot and comes with different languages provided by the third-party publishers.

III. System Architecture:-



1) **WolframAlpha-** It is used to compute expert-level answers of any command using Wolfram's algorithms, knowledgebase and AI technology.

2) **JSON**-JavaScript Object Notation. JSON is a lightweight format for storing and transporting data. JSON is used when data is sent from a server to a web page. JSON is "self-describing" and easy to understand

3) **Speech recognition-** Speech recognition means that when humans are speaking, a machine understands it. In our project we are using Google Speech API in Python to make software which is used to run machines on command. We need to install the Pyaudio python package for recognize the voice commands. Pyaudio is installed using pip install Pyaudio command.

4) **gTTS-** Google's text-to-speech packages converts your audio questions command to text. The response from the look-up function that you write for fetching answer to the question or command is converted in an audio form by gTTS. This package interface with Google Translate's API.

5) **Datetime**-Datetime package is used to showing Date and Time. This datetime module comes with built-in Python.

6) **Wikipedia-** We all know Wikipedia is a great and huge source of knowledge just like GeeksforGeeks or any other sources we have used the Wikipedia module in our project to get more information from Wikipedia or to perform a Wikipedia search. To install this Wikipedia module use pip install wikipedia.

7) **Webbrowser-** To perform Web Search. This module comes built-in with Python.

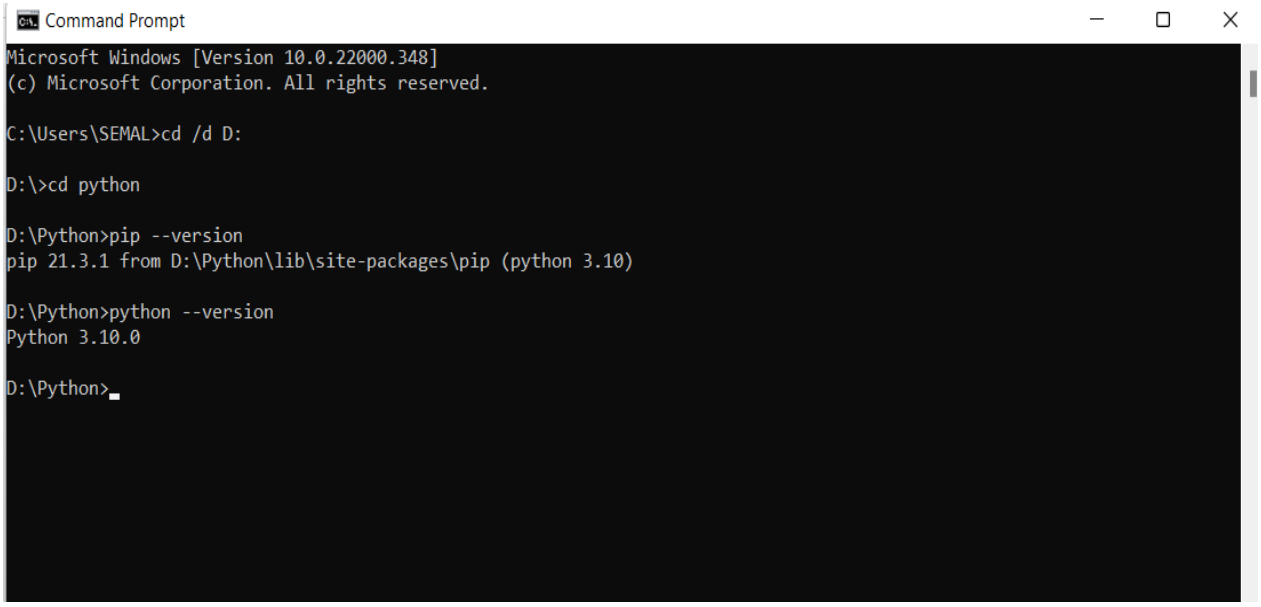
8) **OS**-The OS module in Python provides functions for interacting with the os. OS comes under Python's standard utility modules. This module provides a way of using operating system dependent functionality.

9) **Pyjokes**-Pyjokes is used for collection Jokes over the Internet. Pyjokes is add in our project because it adds jokes in our project . It is very interesting. Pyjokes is the one line joke which makes our project interesting.

10) **Pyaudio**-PyAudio is a set of Python bindings for PortAudio, a cross-platform C++ library interfacing with audio drivers.

11) **Smtplib**- The simple mail transfer protocol library is a Python library for sending emails using the Simple Mail Transfer Protocol (SMTP). The smtplib is a built-in module in python; do not need to install it. It abstracts all the complexities of SMTP away. It provides a Simple Mail Transfer Protocol (SMTP) client implementation.

12) **Requests**- Requests module allows you to send http requests using python. It is used for making GET and POST requests. It abstracts the complexities of making requests behind a beautiful, simple API.



IV. Result:-

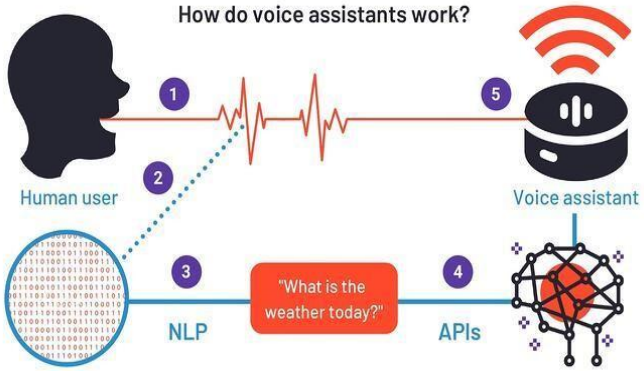
Virtual assistant is a less time consuming. Virtual assistant is a software that understands commands and complete task assigned by client. Virtual assistant use NLP to match user voice or text input withexecutable commands. With the help of virtual assistant you able to run your machine like laptop or PC's on your own command. It is the fast process, therefore it saves time. Virtual assistant is working for you at set times, so always available to you and able to adapt to changing needs quickly.Virtual assistant will be available to you and, should their workload enable, help others too, such as family and colleagues.

V. Conclusion:-

In this paper we have discussed about Personal Virtual Assistant for Windows Using Python. Virtual assistant makes life easier to humans. Virtual assistant is the flexibility to contract for just the services they need. As like Alexa, Cortana, Siri, Google assistant we also make virtual assistant using python for all windows versions. We use Artificial Intelligence technology for thisproject.Virtual Personal Assistants areeffectiveway tomanage or organize your schedule. Virtual Personal assistants are also reliable than Human Personal Assistant because, virtual personal Assistants are more portable, loyal and available to use anytime. Our virtual assistant will be intimate you with suggestions and taking instructions, and will know more about you. We can expectthis device to be permanent.

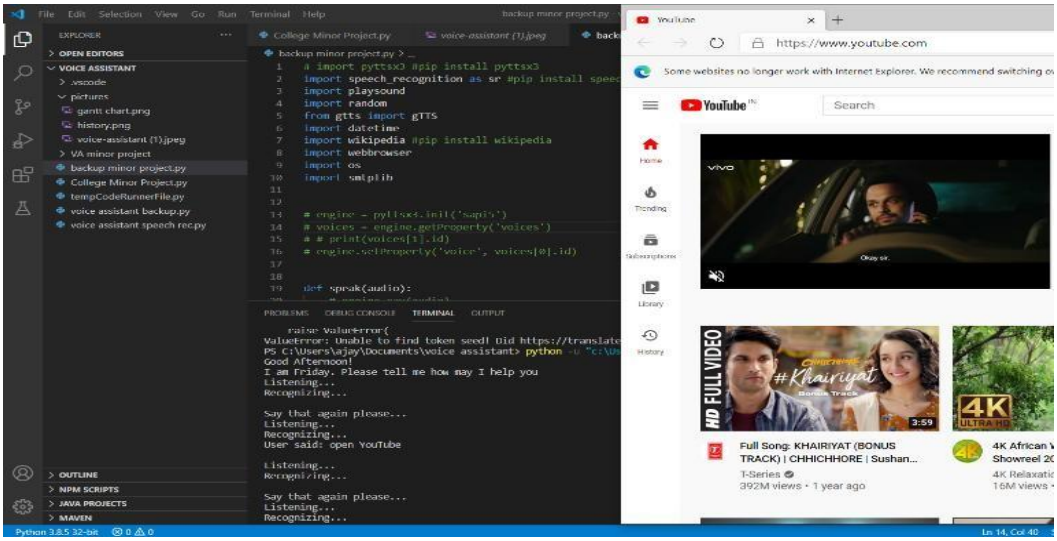
VI. Outcome:-

In this study, we have developed a voice assistant which can perform any kind of task in exchange ofcommandsgivenbytheuserswithoutanyerror. We have added more features like it will listen to theusers'voiceonlyandwillnotbeactivatedfromenvironment noise. The modular nature of this project makes it easy to understand and more flexible. We can add more features in the program without disturbing the functionalities. All the packages required in python programming language has been installed and the code was implemented using VS Code Integrated Development Environment (IDE). The python version used for this project was 3.x and the data of different noises also taken from the environment.



VII. Summary:-

In this study, we have developed a voice assistant which can perform any kind of task in exchange ofcommandsgivenbytheuserswithoutanyerror.We have added more features like it will listen to the users' voice only and will not be activated from environment noise. The modular nature of this project makes it easy to understand and more flexible. We can add more feature in the program without disturbing the functionalities. All the packages required in python programming language has been installed and the code was implemented using VS Code Integrated Development Environment (IDE). The python version used for this project was 3.x and the data of different noises also taken from the environment Methodology.



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