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Voice Assistant Automation System for Applications

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ABSTRACT

The project aims to develop a personal-assistant for computers. Jarvis inspirated from virtual assistants like Cortana, Siri, and Bixby. it's designed to supply a easy interface for closing a range of tasks by using sure well-defined commands. Our personal voice assistant is that the code which will perform task and supply totally different services to the individual as per the individual's settled commands. this is often done through a synchronous method involving recognition of speech patterns then, responding via artificial speech. Through these assistants a user will alter tasks starting from however not restricted to mailing, tasks management and media playback. because the technology is developing day by day individuals have become additional enthusiastic about it, one among the principally used platform is laptop. we have a tendency to all wish to form the employment of those computers more leisurely, ancient thanks to provides a command to the pc is thru keyboard however a additional convenient means is to input the command through voice. For this purpose, there's a desire of a voice assistant which may not solely take command through voice however additionally execute the required directions and provides output

Keywords: *Automated Speech Recognition, Desktop Voice Assistant, Natural Language Generation, Natural Language Processing, Natural Language Understanding, Speech Recognition, Speech Synthesis, Text-To-Speech, Voice Assistant*

1. INTRODUCTION

In recent times solely within the Virtual Assistants we will expertise the most important changes, the approach user interacts and therefore the expertise of user. we have a tendency to area unit already victimisation them for several tasks like switch on/off lights, enjoying music through streaming apps like Wynk Music, Spotify etc., this is often the new technique of interacting with the technical devices makes lexical communication as a brand new ally to the present technology.

The conception of virtual assistants in earlier days is to explain the professionals World Health Organization offer supportive services on the online. the task of a voice is outlined in 3 stages: Text to speech; Text to Intention; Intention to action; Voice assistant are totally developed to boost this vary. Voice assistants aren't befuddled with the virtual assistants, that area unit folks, World Health Organization work nonchalantly and may so handle every kind of tasks. Voice Assistants anticipate our each want, and it takes action.

Voice assistants may be helpful in several fields like IT service, Home automation, time unit connected tasks, voice based mostly search etc., and therefore the voice based mostly search goes to be the longer term for next generation folks wherever users area unit all most hooked in to voice assistants for each desires. During this proposal we've engineered the AI-based voice assistant which may do all of those tasks while not inconvenience. Voice based mostly personal assistants have gained plenty of recognition during this era of sensible homes and sensible devices. These personal assistants may be simply organized to perform several of standard tasks by merely giving voice commands. Google has popularized voice-based search that's a boon for several like senior voters World Health Organization aren't comfy victimisation the keypad/keyboard. For building any voice based mostly assistant want 2

main functions. One for taking note of your commands given and another to retort to commands. in conjunction with these 2 core functions, want the custom-made directions which will feed the assistant.

2. LITERATURE SURVEY

Virtual assistant is boon for everybody during this new era of twenty first century. it's paved method for a brand new technology wherever we are able to raise inquiries to machine and may move with IVAs (Intelligent Virtual Assistants) as folks do with humans. This new technology attracted nearly whole world in some ways like good phones, laptops, computers etc. a number of the numerous VPs (Video Programming Systems) square measure like Siri, Google Assistant, Cortana, and Alexa. Voice recognition, discourse understanding and human interaction square measure the problems that don't seem to be solved nevertheless during this IVAs (Intelligent Virtual Assistants). So, to resolve those problems a hundred users participated during a survey for this analysis and shared their experiences[2].

Table 1: Survey Table

Sl.No	Year	Title	Author	Description
1	2019	The Feasibility of Injecting Inaudible Voice Commands to Voice Assistant	Chen Yan , Guoming Zhang , Xiaoyu Ji	Chen Yan propose DolphinAttack, associate inaudible attack to voice assistants and voice governable devices. It modulates audible voice commands on unhearable carriers so the command signals can not be detected, associate inaudible attack to voice assistants and voice governable devices[3].
2	2020	power efficient smart home with voice assistant	Rahul Kumar, Garima Sarupria, Varshil Panwala, Smit Shah, Nehal Shah	This voice assistant is resolution several alternative queries by giving voice trigger and it solves the matter for the people who aren't knowing a lot of regarding smartphone or maturity folks that will speak in mother language like Hindi, Kannada, etc... For those folks, this voice assistant may be a sensible system[4].
3	2019	Raspberry Pi based voice-operated personal assistant	Piyush Vashistha, Uginder Pal Singh, Pranav Jain Jitendra Kumar	They planned Raspberry Pi based mostly voice-operated personal assistant that brings a lot of comfort and ease for the debilitated people. It combined with AI and propelled information analytics utilizing Google Assistant API, this assistant develops the aptitude to form a sympathetic and customised association with the shoppers[5].
4	2020	Privacy Issues in Voice Assistant Ecosystems	Georgios Germanos	They examined privacy problems in voice assistant ecosystems. once describing a typical voice assistant system, they bestowed the prevailing legislation on personal processing among the EU and its privacy aspects, then created a literature review of existing IoT forensics methodologies. Their main goal was to spot the kinds and site of information that reside among a voice assistant system. For this reason, they engineered their own testbed that simulated the functioning of Amazon's Alexa, Google's Assistant and Microsoft's Cortana voice assistants[6].
5	2020	Artificial Intelligence based Voice Assistant	Subhash S, Prajwal N Srivatsa, Siddesh S	They build a hands-free application that may be a terribly straightforward application. furthermore because it is employed during a business field as an example in laboratory, the person wears gloves and body suits for his or her safety purpose, through this voice assistant they'll get any data in order that their work becomes simple[7].

6	2020	Short Research on Voice Control System Based on Artificial Intelligence Assistant	Tae-Kook Kim	This system permits users to implement their own system through the advantageous voice recognition interface and numerous modules. The planned system is predicted to have an effect on the event of the voice management AI market and connected systems.
7	2012	Voice Output Communication Aid Application for Personal Digital Assistant for Autistic Children	Ippei Torii, Kaoruko Ohtani, Nahoko Shirahama , Takahito Niwa , Naohiro Ishii	They developed a brand new communication assistant tool with personal organizer, "Let's Talk!", for unfit youngsters. If unfit youngsters feel the enjoyment of communication by victimization this application, they're going to be powerfully driven to undertake to know alternative thoughts. This application might have a lot of risk to be utilized by not solely unfit youngsters however additionally folks that have issues of communication attributable to some diseases, like tubular cavity cancer, brain disease from a stroke, or dementia.
8	2019	Development of Voice Commands in Digital Signage for Improved Indoor Navigation Using Google Assistant SDK	David Sheppard, Nick Felker, and John Schmalzel	Overall, the advantages of a sensible Sign became apparent throughout development and testing of the device. the requirement for fast Associate in Nursingd concise directions is commonly completed by many folks after they are attempting to navigate an strange place. The testing and feedback incontestible that the good Sign shows promise in aiding indoor navigation of the longer term. whereas there area unit more commands and options that has got to be additional to the applying, this good Sign continues to be below development and it will be simply scaled to be used in larger applications.
9	2020	Voice Controlled Personal Assistant Robot for Elderly People	Jishnu U, KIndu V, K J Ananthakrishnan	They designed and developed a private assistant automaton, that is controlled by voice commands to choose long/short distance objects. oral communication between the automaton and robot smartphone is completed via Bluetooth. This projected four wheeled automaton consists of a camera and robotic arm. The camera is employed for object detection, distance mensuration, and a robotic arm to perform choose and place actions.
10	2017	Architecture for Automatic Generation of User Interaction Guides with Intelligent Assistant	Inchul Hwang, Jinhe Jung, Jaedeok Kim, Youngbin Shin, Jeong-Su Seol	The design for the automated generation of user guide interaction with Intelligent Assistant. They additional automatic generation module as well as three submodules in intelligent assistant design for automatic generation of user guides and showed that the practicability by developing the model. This paper showed the chance of the user guide interaction with Intelligent Assistant. to boot, extend this system with multimodality-based suggestion system.

3. PRESENT SYSTEM

Present System is one that is already gift within the market.

Currently six well-liked voice assistant area unit running in our good world:-

• Amazon Alexa: Alexa is Amazon's voice-based AI-powered digital assistant that powers a whole good device scheme. Alexa will be merely place to figure by giving it the command.

• Google Assistant: Google Assistant is a man-made intelligence–powered virtual assistant developed by Google that's primarily accessible on mobile and good home devices. in contrast to the company's previous virtual assistant, Google Now, the Google Assistant will have interaction in two-way conversations.

• Cortana: Cortana is Microsoft's personal productivity assistant that helps you save time and focus attention on what matters most. to urge started, choose the Cortana icon on the taskbar. ... be a part of a gathering in Microsoft groups or verify UN agency your next meeting is with. produce and manage lists.

• Siri: Siri may be a digital personal assistant, integrated at intervals Apple device in operation systems, that permits Apple device users to urge answers to queries, check the weather, make sure flights, perform searches, answer queries, complete actions, send a message and far additional.

• Bixby: Bixby is that the Samsung intelligence assistant initial introduced on the Galaxy S8 and S8+. you'll be able to move with Bixby exploitation your voice, text, or taps. It's deeply integrated into the phone, that means that Bixby is in a position to hold out loads of the tasks you are doing on your phone.

These assistants area unit extremely competitive with one another, however there area unit some options which can not add these higher than assistants they are:-

List of objectives:
1) To access differing types of internet sites.
2) ending the system through voice command.
3) Restart the system through voice command.
4) lockup the system through voice command.
5) Accessing current location, etc.
6) Automation system of chrome, Whatsapp, Youtube, on-line category.

4. MODULES

The speech recognition module used the program is Google‘s Speech Recognition API that is foreign in python mistreatment the command ―import speech recognition as sr. This module is employed to acknowledge the voice that is given as input by the user. this can be a free API that's provided and supported by Google. this can be a awfully light-weight API that helps in reducing the scale of our application.
Algorithm:
Step1:-Import speech acknowledge as sr.
Step2:-Define function: takecommand().
Step3:-Use recognizer as sr.recognizer() to acknowledge speech.
Step4:-Use microphone() as a input supply.
Step5:-The recognised speech are going to be threshold for sure second.
Step6:-Create a variable ‘query’ & use any language through google.

- TTS & STT

The voice that is given as input is initial regenerate to text victimization the speech recognition module. The text is then processed to grant the results of the question given by the user. the ultimate step is that the conversion of the results of the processed question to speech that is that the final output. the foremost time intense among the 2 is STT as a result of the system initial needs to hear the user and totally different|completely different} users have different, some ar straightforward to grasp whereas some don't seem to be simply hearable. this can be the step upon that our total execution time depends. Once the speech is regenerate to text execution commands and giving the results back to the user isn't a long step.

- PYTTSX3

The pyttsx3 is AN offline module that's used for text to speech conversion in Python and it's supported by each Python a pair of & three. The run and wait practicality is additionally during this module solely. It determines what proportion time the system can watch for another input or in alternative words the measure between inputs. this can be a free module obtainable within the python community which might be put in victimization the pip command rather like alternative modules.

Algorithm:
Step1:-Import pyttsx3 for extracting feminine or male voice as (0 or 1)
Step2:-Initialize sapi5(voice of female/male)
Step3: Set the voice of male/female on our project.
Step4:-Define function: Speak()
Step5:-Set audio as variable to perform “speak” here we have a tendency to provide some set of statements

- DATETIME

The DateTime module is foreign to support the practicality of the date and time. for instance, the user desires to grasp this date and time or the user desires to schedule a task at a precise time. in brief this module supports categories to govern date and time and perform operations per it solely. this can be a vital module, particularly in tasks wherever we would like to stay a track of your time. This module is incredibly tiny in size and helps to regulate the dimensions of our program. If the modules area unit overlarge or significant then the system can lag and provides slow responses[9].

➢ WEBBROWSER

This module permits the system to show web-based info to users. for instance, the user desires to open any web site and he offers input as ―Open Google‖. The input is processed victimisation the online browser module and also the user gets a browser with google opened in it. The browser which is able to be used is that the default set application[9].

➢ WIKIPEDIA

Wikipedia could be a library in python that it doable for the virtual assistant to method the queries concerning Wikipedia and show the results to users. this can be an internet library and desires a web affiliation to fetch the results. The no. of lines that the user desires to urge as a result will be set manually[9].

➢ OS MODULE

OS Module provides associate software system dependent functionalities. If we would like to perform operations on files like reading, writing, or manipulate ways, of these kinds of functionalities square measure offered in associate OS module. All the operations offered raise a slip a slip case of any error like invalid names, paths, or arguments which can be incorrect or correct however simply no accepted by the software system.

Algorithm

Step1:- import os module

Step2:-os module calls startfile() os.startfile(any file path)

Step3:startfile() is employed to access the file location

Step4:Stop

➢ DESIGN

The overall style of our system consists of the subsequent phases:

♣ Taking input from the user within the sort of voice.

♣ Converting the speech into text to be processed by the assistant.

♣ The born-again text is currently processed to urge the desired results.

♣ The text contains one or 2 keywords that confirm what question is to be dead. If the keyword doesn‘t match any of the querries within the code then the assistant asks the user to talk once more.

♣ The result that is within the sort of text is born-again to speech once more to convey results to the user.

➢ WOLFRAMALHA

Wolfram Alpha is AN API which might reason expert-level answers victimisation metallic element‘s algorithms, knowledge domain and AI technology. it's created doable by the metallic element Language[10].

5. PROPOSED SYSTEM

We projected the voice assistant wherever we have a tendency to performed some tasks supported voice assistant we have a tendency to offer the voice commands as associate input we have a tendency to decision the functions to perform specific tasks. we've got enforced some modules to decision those functions. when acting the task it'll offer the output within the voice format.

♣ Locking device: we've got used module known as OS() to lock the device through voice command.

♣ Shutting down device: we've got used module known as OS() to conclusion the device through voice command.

♣ Restart device: we've got used module known as OS() to restart the device through voice command.

♣ Opening applications with voice: we've got used module known as OS() to open any individual application .

♣ WhatsApp automation: we've got used module known as pywhatkit() to alter the whatsapp.

♣ YouTube automation: we've got used module known as webbrowser() to alter the you tube.

♣ Chrome automation: we've got used module known as webbrowser() to alter the chrome.

♣ Online category automation: we've got used module known as webbrowser() to alter the net categories.

♣ Home automation: it's accustomed management the sunshine bulb victimisation voice command .

The data that's collected within the speech kind is keep and used as input for next section of the method. In next section, the input that is given within the type of voice is processed unendingly and is born-again into text victimisation STT (Speech-to-text). In third section, the text that is born-again is analysed by Python Script that processes it and identifies the action to be taken for the command. within the last section, when the action to be taken is known, output are obtained from text to speech conversion victimisation TTS (Text-To-Speech dealing pursuit System).

6. ARCHITECTURE

Software architecture refers to the fundamental structures of a software system and the discipline of creating such structures and systems.

The below architecture of voice assistant automation system for application consists of three modules i.e., user, computer and voice assistant[8].

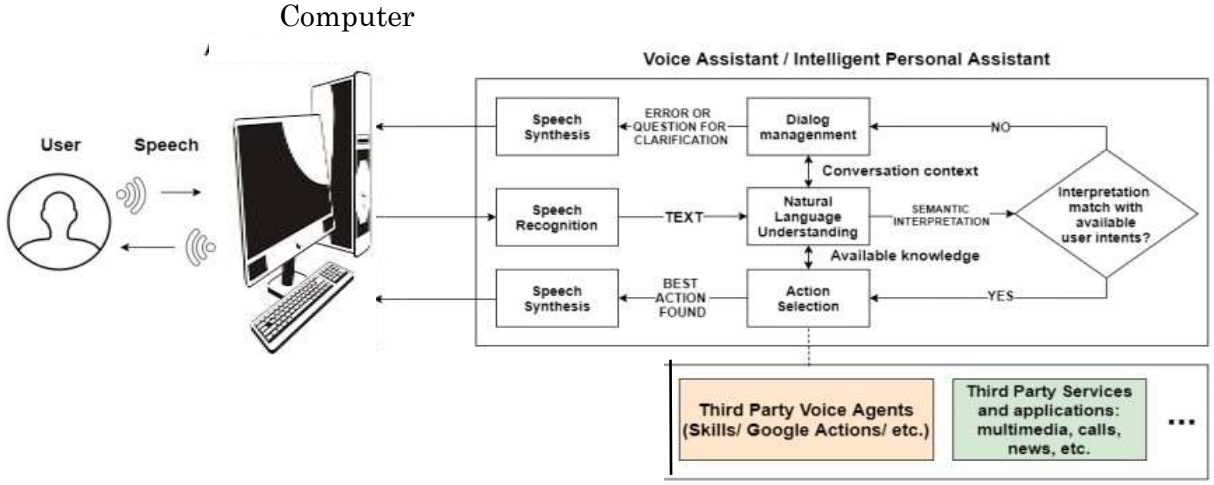


Fig. 4.1 Architecture Diagram for voice assistant

Components of the architecture.

1) User: User could be a one who goes to present a voice command through pc or laptop computer mike.
2) Computer: Here pc acts as a treater between user and voice assistant.
3) Voice Assistant: it's associate intelligent personal assistant that consists of:
a) Speech Synthesis: Speech synthesis (or Text to Speech) is that the computer-generated simulation of human speech. It converts human language text into human-like speech audio. during this tutorial, you may find out how you'll be able to convert text to speech in Python.
b) Speech Recognition: Speech recognition helps United States of America to avoid wasting time by speaking rather than writing.
c) Dialog management: A dialog manager (DM) could be a part of a dialog system (DS), liable for the state and flow of the language.
d) Natural Language Understanding: language understanding could be a branch of computing that uses pc computer code to know input within the sort of sentences victimization text or speech.
e) Action Selection: Action choice could be a method of characterizing the foremost basic drawback of intelligent systems: what to try and do next. generally for anybody action-selection mechanism, the set of doable actions is predefined and glued.
f) Third Party Voice Agents: These area unit voice agent‘s helps in speaking the content from the browser.
g) Third Party Applications: A third-party app could be a computer code application created by somebody apart from the manufacturer of a mobile device or its software system.
The design style consists of those phases:
1) Collection of knowledge that is in speech format.
2) Analyse the voice and convert it to text.
3) Storing the information and process it.
4) Speech generation from the text output that's processed.

6. ALGORITHM FOR WHATSAPP MESSAGE, CALL AND VIDEO CALL

In this we tend to square measure activity WhatsApp message, decision and videocall tasks through voice command. once a voice command is given to the assistant for WhatsApp message then it raise to user that “whom the message is for” and “what is that the message”, therefore the assistant search the person and it kind the message within the chat box and it mechanically sends it to it person.

Algorithm
Step1: import pywhatkit (used for whatsapp automation)
Step 2: outline operate whatsapp message ()
Step 3: employing a operate known as begin file we tend to open the whatsapp message.exe file.
Step4 : victimisation the coordinates we are going to do some operations like write, press and etc.
step 5:For whatsapp decision and video chat The step four is continual**Algorithm for**

7. CHROME AUTOMATION

In this we tend to ar playing chrome automation task wherever through voice commands we tend to perform chrome tasks. There ar some constitutional perform keys for operational those tasks in chrome. and that we use some perform like press and release() to perform those tasks.

ALGORITHM :
Step 1: From keyboard import *
Step 2: import internetbrowser as web
Step 3: outline perform ChromeAuto(query)
Step 4: Initialize str(command) to question
Step 5: If new tab then press_and_release “ctrl+t”.
Step 6: else if shut tab then press_and_release “ctrl+w”.
Step 7: The higher than perform is termed within the main.

8. ALGORITHM FOR YOUTUBE AUTOMATION

In this YouTube automation task is completed through voice commands. There area unit some integral perform keys like "space_bar","f","t","l","j",etc for operational those tasks in YouTube. and that we use some perform like press() to perform those tasks.

ALGORITHM:

Step 1: From keyboard import *
Step 2: From pyautogui import *
Step 3: import netbrowser as web
Step 4: outline perform YouTubeAuto(query)
Step 5: Initialize str(command) to question
Step 6: if "pause" press key.
Step 7: else if "full screen" press f.
Step 8: The on top of perform is additionally referred to as in main.

9. ALGORITHM FOR ONLINE CLASS AUTOMATION

In this we have a tendency to ar playacting on-line category automation task. Here we have a tendency to decision the category name through voice command wherever the assistant opens the link of the category and makes the mic and video put off and perform the need task.

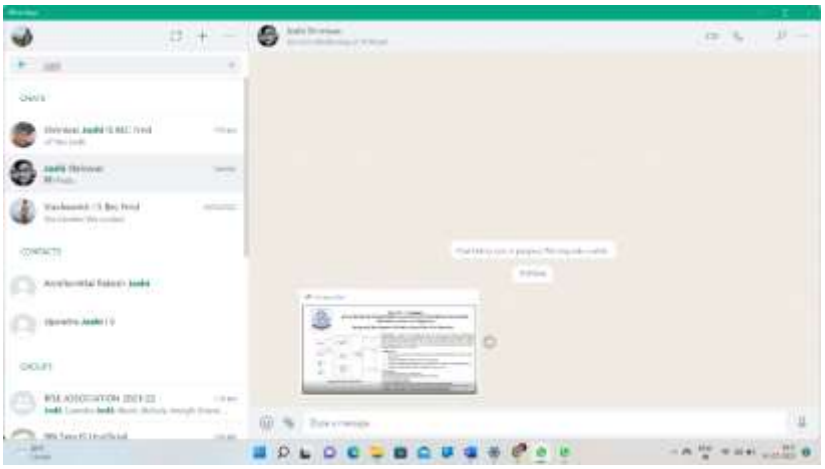
ALGORITHM:

Step 1: From pyautogui import *
Step 2: import netbrowser as web
Step 3: outline perform onlineclass (subject)
Step 4: if science = subject, open link.
Step 5: this perform is named in main.

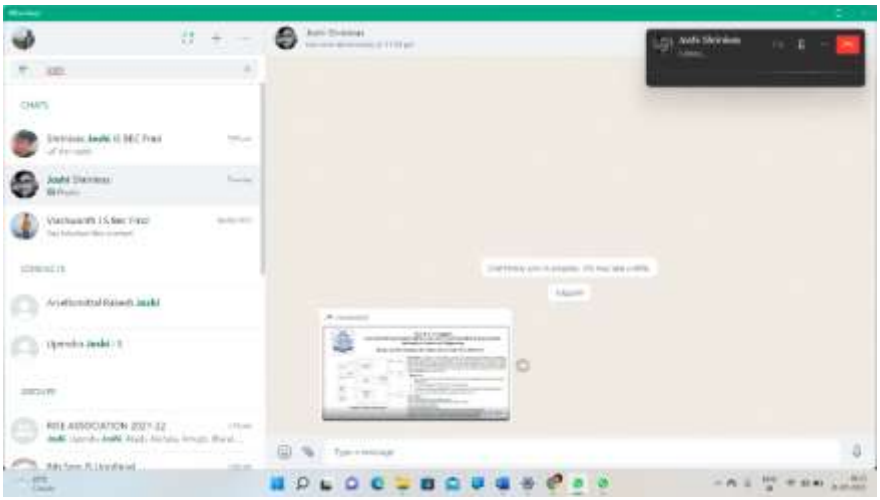
10. SNAPSHOTS

Results of WhatsApp automation

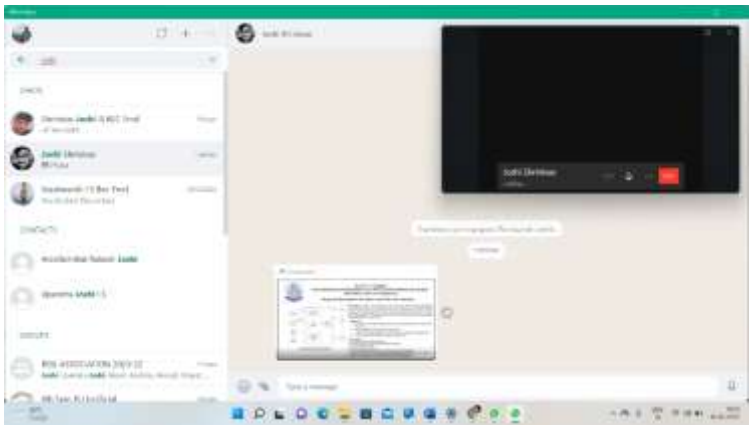
1.For the WhatsApp message:-



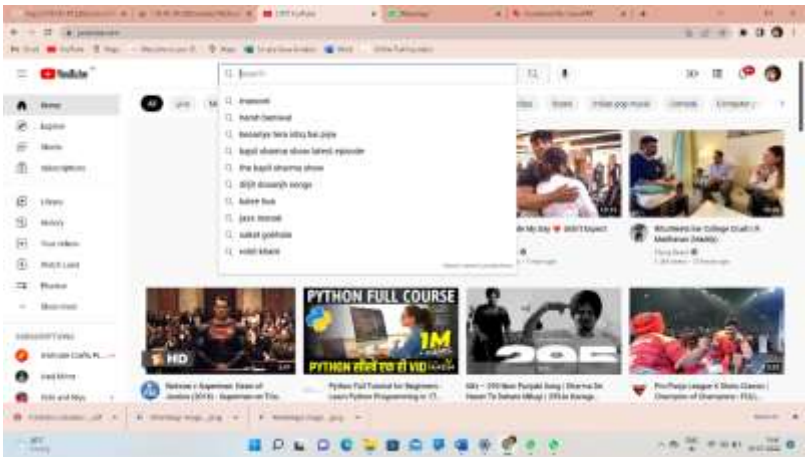
2.For the WhatsApp call



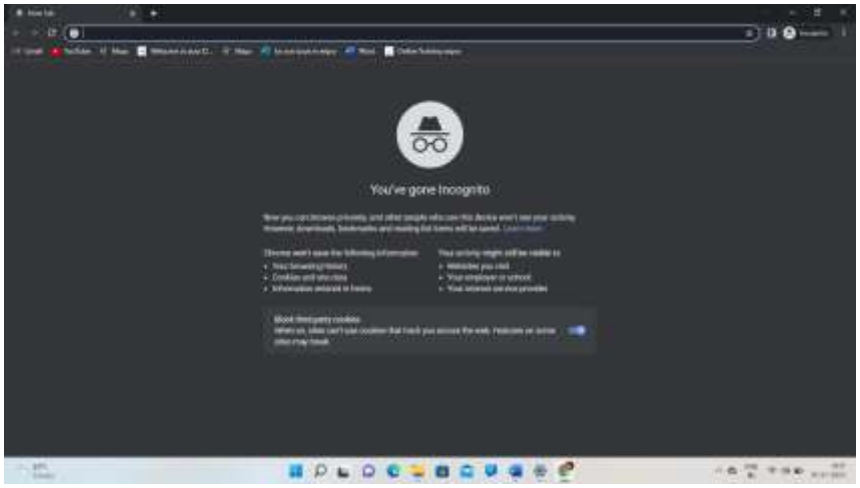
3.For the WhatsApp video call

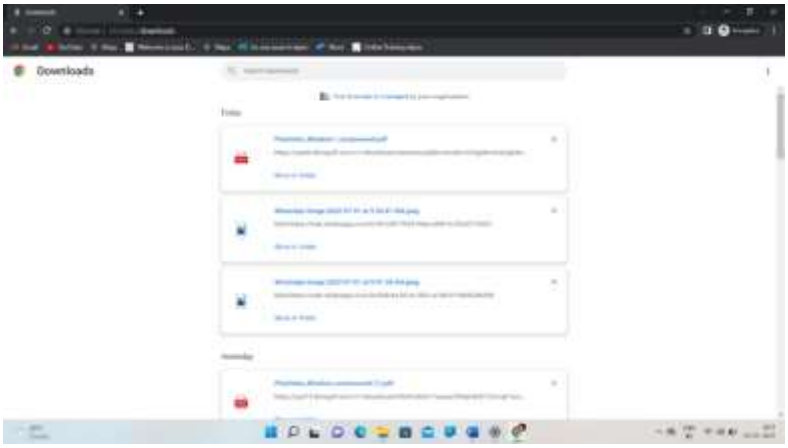


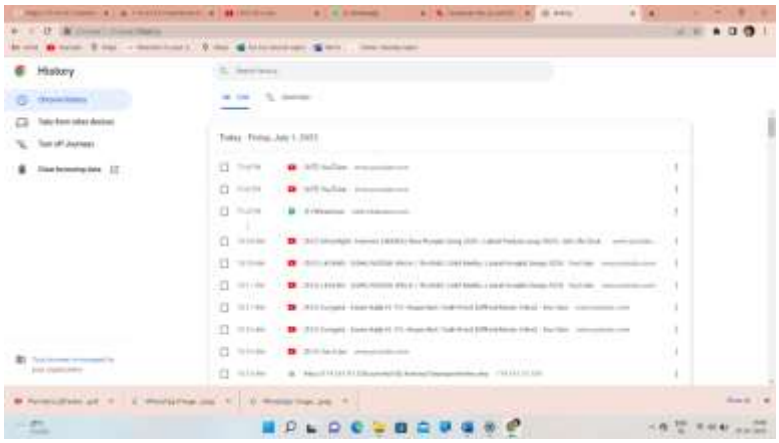
Results of YouTube Automation:-



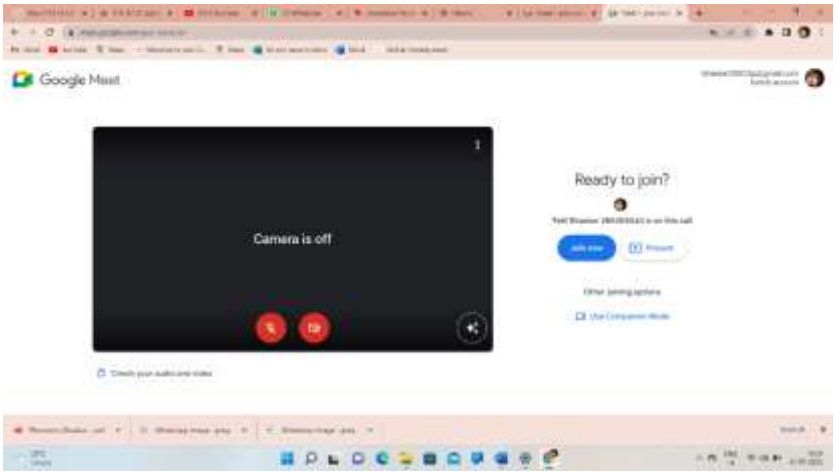
Results of chrome Automation:-







Results for online class Automation:-



11. CONCLUSION

Voice assistants have had a large amendment in user‘s interaction with technologies embedded in their devices. like several different technology of such magnitude, they need altered the essential genome of the sphere during which they operate. whereas this has mostly created a far better world with forceful edges for communities, that were before unbroken in dark with regard to technological innovations, they need posed new quite threats with relevance user‘s privacy and security.

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