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# VIRTUAL ASSISTANT WITH PYTHON

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***Abstract*—This paper discusses ways in which new technology could be harnessed to create an intelligent Virtual Assistant with a focus on user based data. It will look at examples of intelligent programs with natural language processing that are currently available, with different categories of support, and examine the potential usefulness of one specific piece of software as a Virtual Assistant. This engages the ability to communicate socially through natural language processing, holding and analysing data within the context of the user. It is suggested that new technologies may soon make the idea of virtual personal assistants a reality. Experiments conducted on this system, combined with user testing, have provided evidence that a basic program with natural language processing algorithms in the form of a Virtual Assistant , with basic natural language processing and the ability to function without the need for other type of human input (or programming) may already be viable.**

***Keywords*— Virtual Assistant, Python, NLP, Wolfram Alpha API, Desktop Assistant, Python, Machine Learning, Text to Speech, Speech to Text, Language Processing, Voice Recognition, Artificial Intelligence, Internet of Things (IoT), Virtual Assistant.**

## I. INTRODUCTION

The basic idea behind this project is to create a simple stand-alone application that helps less tech savvy [Doesn't have the deep computer Knowledge] people in the world to use the computer without feeling ignorant or computer illiterate. Computers have become a very important devices and as well as less expensive over time. The application works same like Siri/ Google Assistant etc. But the application deals with the computer itself mainly.

The virtual assistant is nothing but an implementation of assistance virtually on the user's PC (Personal Computer). The software can be used via voice, keyboard input and also using internet as the remote access.There are some predefined commands in the system and user can also add new commands. System can notify the user about new emails, weather, location, etc. User can see IP addresses, MAC address and Wireless network passwords, etc. System tasks like shutdown, lock system, sleep etc. are also executed on command. Note writing can also be done using this system. The system has a Interface which is able to take inputs and give outputs. There are various separate modules for each task like time, search etc. The Interface calls these modules for the given commands and so on. Same tasks can be achieved using this software.

This project is based on Windows application development and provide personal assistant using voice recognition operation. This program includes the functions and services of: mail sending, , event handler, location services, music player service, checking weather, Google searching engine, Wikipedia searching engine, camera and Bluetooth headset support . As it integrates most of the desktop services for daily use, it could be useful for getting a more convenient life and it will be helpful for those people who have disabilities for manual operations. This is also part of the reason why it has been chosen as the diploma project. This project is originated from a popular application from Apple called "Siri".

This application was released on the date when the iPhone4S was published. This application is very interesting, easy going and convenient, with wide real world usage and large developing potential. This application is not limited by different generations and occupations, and can be applied to many industries that we have in the real world. But it is not available for windows , to overcome this problem we have introduced a "Virtual Assistant" for your personal computer. For instance, the voice assistance is very useful for personal assistants, direction guides or driving, helps among the disabled community, and so on.

This is a short description about "Siri" from Wikipedia to illustrate the voice product: "Siri" an intelligent personal assistant and knowledge navigator which works as an application for Apple's iOS. The application uses a natural language user interface to answer questions, make recommendations, a perform actions by delegating requests to a set of web services. Apple claims that the software adapts to the user's individual preferences over time and personalizes results, and performing tasks such as finding recommendations for nearby restaurants or getting directions

## II. LITERATURE SURVEY

Speech recognition has a long history with several waves of major innovations. Speech recognition for dictation, search, and voice commands has become a standard feature on smartphones and wearable devices. Design of a compact large vocabulary speech recognition system that can run efficiently on computers, accurately and with low latency. Set of techniques for improving the performance of automated voice search services intended for windows users accessing these services over a range of portable devices Speech recognition and machine getting to know have persevered to be refined, and based records served through packages and content providers have emerged. We agree with that as computer systems turn out to be smaller and greater ubiquitous [e.g., wearable's and Internet of Things (IoT) . The recognizer is designed to change a verbal articulation from a individual into an alternate method of data (e.g., text). A hand held individual colleague including a voice recognizer and a characteristic dialect processor is disclosed. This snippet of data can be a plan for the day, data in the individual's logbook or data from the individual's address book, Such as a telephone number The Most well known utilization of iPhone is "SIRI" which causes the end client to impart end client versatile with voice and it additionally reacts to the voice charges of the client. It is named as Personal Assistant with Voice Recognition Intelligence, which takes the client contribution to type of voice or content and process it and returns the yield in different structures like activity to be performed or the item is directed to the

end client. Furthermore, this proposed framework can change the method for communications between end client and the cell phones but our assistance is pretty compatible with windows OS.

Cortana can likewise read your messages, track your area, watch your perusing history, check your contact list, watch out for your date-book, and set up this information together to propose valuable data, on the off chance that you enable it. You can likewise type your inquiries or solicitations, in the event that you want to not stand up uproarious. It is only desktop based virtual assistant. Siri: Siri has been an integral part of iOS since the dispatch of iOS 5 of every 2011. It began with the nuts and bolts, for example, climate and informing, yet has extended significantly from that point forward to help all the more outsider mix with MacOS. While Siri's jokes are unbelievable, the virtual aide is getting more able consistently. Presently, you can request that it call individuals, send messages, plan gatherings, dispatch applications and recreations, and play music, answer questions, setup dates, and give climate conjectures. Google Assistant: Google Assistant (which has consolidated capacities from the more seasoned Google now, as now is being eliminated) is unique in relation to Cortana and Siri.

### A. *Background of the industry based*

As background of the industry based this project is originated from a popular application from Apple called "Siri". This application was released on the date when the iPhone4S was published. This application is very interesting, easy going and convenient, with wide real world usage and large developing potential. This application is not limited by different generations and occupations, and can be applied to many industries that we have in the real world. But it is not available for windows , to overcome this problem we have introduced a " Virtual Assistant" for your personal computer. For instance, the voice assistance is very useful for personal assistants, direction guides or driving, helps among the disabled community, and so on.

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### B. *Information Retrieval*

As this program includes the functions and services of: mail exchange, mathematical calculations, location services, music player service, checking weather, Google searching engine, Wikipedia searching engine, camera, Bluetooth headset support, IP address finding, Saved Wi-Fi passwords finding and help menu. The list below indicates the information and the requirements of each individual function.

- Mail exchange, customers are able to send the mail to the person with mail address in the contacts.By giving a correct command contains the mail request keyword together with the destination person; the mail should be received by the recipient after it has been sent.
- Location services, location services provide the functions for the user to check the current location or find the destination. The user should get an easy to understand map with the locations depending on the category of the request.
- Music player service, the music player offers the services to the user to play a named or a randomly picked song in the pre-stored song list on the desktop PC. And it could be stopped when the user wants to terminate it.
- Checking weather, the user could check the weather in any place. In addition, the weather is returned with the temperature and humidity; the user could also check the weather for current day, tomorrow or in next four days.
- Google searching engine, the search engine enable the user to search anything on Google. The search engine will give result list back and displayed on the browser.
- Wikipedia searching engine, the search engine enable the user to search anything on Wikipedia. The result is given back on the web browser with the searched content on Wikipedia.
- Camera, the camera function will call the camera on the mobile phone to take a picture of the current view, the picture will be stored in the Gallery for later viewing and operation.
- Bluetooth headset support, since it is not possible to do the voice recognition while the music player is playing or the surroundings are noisy; the Bluetooth headset support makes it possible to speak to the headset rather than the PC's if the user enables it.
- Application Opening and closing service, Using this service User can open any applications that are installed , Most common applications are MS Word, MS PowerPoint, Paint, Notepad, IDE's, Text Editors, File Explorer and many more.
- IP address service, the IP address service is especially designed for Programmers Other than any IT person , Using this service user can find hostname and IP address of the PC MAC address finding service, same as IP address service.
- Wireless Network Passwords Finding Service, Wi-Fi Password service is used to find saved wireless network passwords
- Writing note service , this service enables the User to write a note over voice, Basically it uses the SPEECH-TO-TEXT module
- Tell a Joke service, Joke service is very funnier thing in our software, it is used for entertainment purpose it tells a joke to User on Users demand
- Time and Date service, the purpose of this service is just tell what time is it or date or day.
- Calculation service, Calculation service is used for mathematical operation like multiplication, division, sin, cos values, etc.
- Intelligent Service, The intelligent service offers the functionality of what type question user can ask any question to the Virtual Assistance like "What is python Programming"
- Basic System Operation, this service offers the basic functionalities like locking current window, log off User Account, Shutdown PC, etc.

### C. *Theory Model*

The project is based on the theories related to various aspects of software engineering principles and software development model; Python programming skills and API's and network communication technologies.

The API's and the web service in this project are put on the wolfram alpha API; developers will never be required to write more code. The API will handle the execution. Hence, API is an important concept and theory guide the development.

Wolfram Alpha API: The Wolfram Alpha Web service API provides a web-based API allowing the computational and presentation capabilities of Wolfram Alpha to be integrated into web, mobile, desktop, and enterprise applications. Wolfram Alpha is an API which can compute expert-level answers using Wolfram's algorithms, knowledgebase and AI technology. It is made possible by the Wolfram Language. This article tells how to create a simple assistant application in Python which can answer simple questions like the ones listed below.

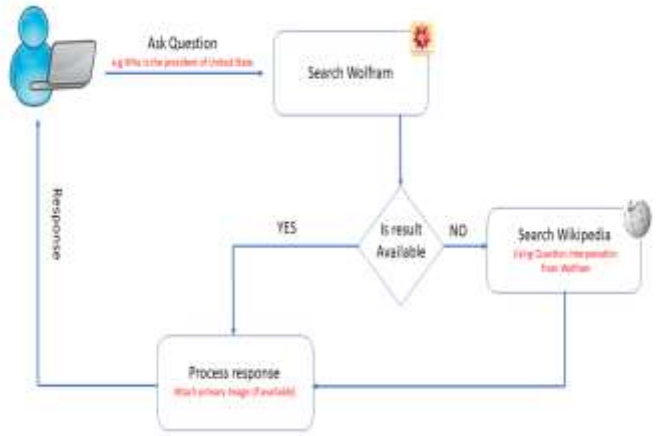


*Figure 1*

User's input will be passed to Wolfram Alpha for processing. if a result is obtained, the result will be returned to the user. If no result is obtained, an interpretation of the input is used as a keyword(s) for Wikipedia query.

## III. Equipment – Choice of Materials

### A. *Develop tools and environment:*

Python3: Python is a general-purpose interpreted, interactive, object-oriented, and high-level programming language. Python 3.0 was released in 2008. Although this version is supposed to be backward incompatibles, later on many of its important features have been backported to be compatible with version 2.7 □

Visual Studio Code: It is a source-code editor developed by Microsoft for Windows, Linux and macOS. It includes support for debugging, embedded Git control and GitHub, syntax highlighting, intelligent code completion, snippets, and code refactoring.

Sublime Text: It is a shareware cross-platform source code editor with a Python application programming interface. It basically supports many programming languages and markup languages, and functions can be added by users with plugins, typically community-built and maintained under free-software licenses.

### B. *API and Python Libraries:*

Google Speech API : Speech Recognition is an important feature in several applications used such as home automation, artificial intelligence, etc. This article aims to provide an introduction on how to make use of the SpeechRecognition library of Python. This is useful as it can be used on microcontrollers such as Raspberri Pis with the help of an external microphone. We chooses Google Speech API because Google has a great Speech Recognition API. This API converts spoken text (microphone) into written text (Python strings), briefly

Speech to Text. You can simply speak in a microphone and Google API will translate this into written text. The API has excellent results for English language.

Wolframalpha API: The API allows clients to submit free-form queries similar to the queries one might enter at the Wolfram|Alpha website, and for the computed results to be returned in a variety of formats. It is implemented in a standard REST protocol using HTTP GET requests.

Text to Speech: pyttsx3 is a text-to-speech conversion library in Python. Unlike alternative libraries, it works offline, and is compatible with both Python 2 and 3.that's why we used this library.

## IV. Conclusions

*The Project development and implementation:*

As it has been previous stated, the program is mainly concerns with the windows based software development, Python programming, different APIs for Google products, API for mathematical operations and etc. The program is developed by three developers and follows the Incremental model and extreme programming model. During the six month development, the students did the same cycle in each phase of analyze requirements, construct design, implement the solutions in pair programming mode and test the result. The development is carried out as its primary planning which guide the work process of how to work with the program, how much time should the each of the student spent in every week,the rescores needed for developing and how to handle the problems while it came up. The project wasefficiently completed under the development model and the resources we found in early time were really useful when implementing the program.

*Project usage & prospect, potential:*

The project is very useful and owns a large potential use in different industries. Although the program primary concerns more about how to do the virtual assistant on windows based system using the voice, the concept of speech recognition can be applied in different industries as in many situations it will be more convenient, save a lot of time and helpful especially for those who have difficulty in working with manual operations. Thus, the concept is only for programming the windows based Application For the program itself, it is a collection of 15-20 functions that are frequently used on a windows PC. The user can enjoy different services within this platform. Therefore, it is easy to use with simple operation compared with the traditional working strategies which the user should well know how to work with the desktop system. In addition, the program which works using the voice is helpful for those who prefer voice operation and those who have difficulty /disability with the manual operations. The primary objective of the program is to provide services using the voice, and it enables more people who can enjoy this program.

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