

AMRITSAR GROUP OF COLLEGES

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Project Lab Report

On

AI Voice Command Assistant

Submitted in the partial fulfillment of the requirement for the award of degree of

Bachelor of Technology

In

COMPUTER SCIENCE & ENGINEERING

Batch (2019-2023)



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NBA Accredited (2009-12, 2016-18)

ABSTRACT

The project aims to develop a personal-assistant for. Jarvis draws its inspiration from virtual assistants like Cortana for Windows, and Siri for IOS. It has been designed to provide a user-friendly interface for carrying out a variety of tasks by employing certain well-defined commands. Users can interact with the assistant either through voice commands or using keyboard input. As a personal assistant, Jarvis assists the end-user with day-to-day activities like general human conversation, searching queries in google, bing or yahoo, searching for videos, retrieving images, live weather conditions, word meanings, searching for medicine details, health recommendations based on symptoms and reminding the user about the scheduled events and tasks. The user statements/commands are analysed with the help of machine learning to give an optimal solution.

DECLARATION

We declare that the project work entitled “**AI Voice Command Assistant**” is prepared by us under the guidance of **Er. Dipika Malhotra**.

During the development of this project, emphasis was given to the problems faced by beginner programmer requirements. As we are submitting this project for the partial fulfillment of the requirement for the award of the degree of B.Tech, We wish to declare that this project is developed by us and none of its components is copied from anywhere.

Signature

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AKNOWLEDGEMENT

This is a humble effort to express our sincere gratitude towards those who have guided and helped us to complete this project.

We are grateful to Amarpreet Sir for their invaluable assistance during the duration of this research. They aided us in completing this job successfully by giving their ideas and suggestions. They have invested important time in reading and comprehending this work. Their thoughts and advice were really beneficial in helping me create and implement this project in a more efficient manner.

I'd also like to express my heartfelt gratitude to **Dr. Sandeep Kad**, Head of Department, CSE and our Professor **Er. Dipika Malhotra** for their constant support and recommendations over the duration of this project.

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PYTHON



Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages.

- **Python is Interpreted** – Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.
- **Python is Interactive** – You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.
- **Python is Object-Oriented** – Python supports Object-Oriented style or technique of programming that encapsulates code within objects.
- **Python is a Beginner's Language** – Python is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

History of Python

Python was developed by Guido van Rossum in the late eighties and early nineties at the National Research Institute for Mathematics and Computer Science in the Netherlands.

Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, SmallTalk, and Unix shell and other scripting languages.

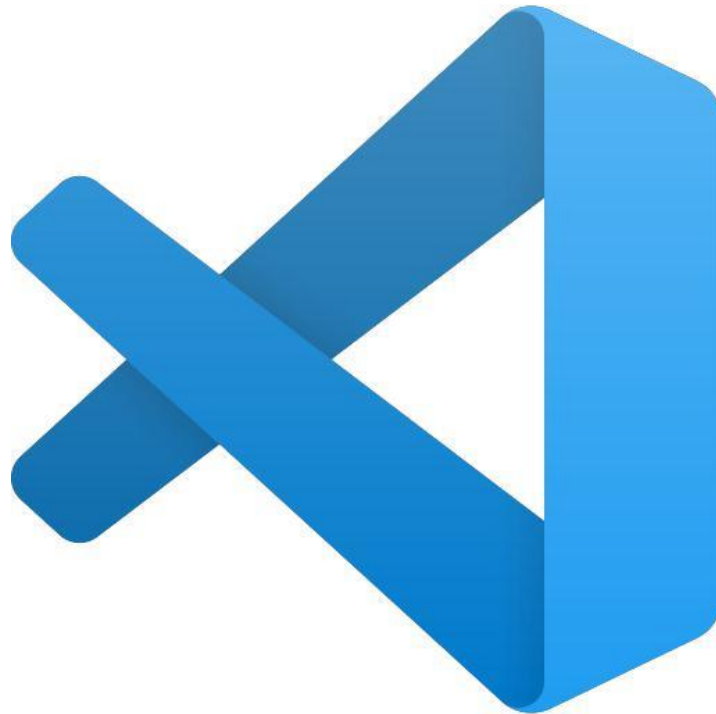
Python is copyrighted. Like Perl, Python source code is now available under the GNU General Public License (GPL).

Python is now maintained by a core development team at the institute, although Guido van Rossum still holds a vital role in directing its progress.

Python's features include –

- **Easy-to-learn** – Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.
- **Easy-to-read** – Python code is more clearly defined and visible to the eyes.
- **Easy-to-maintain** – Python's source code is fairly easy-to-maintain.
- **A broad standard library** – Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.
- **Interactive Mode** – Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.
- **Portable** – Python can run on a wide variety of hardware platforms and has the same interface on all platforms.
- **Extendable** – You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.
- **Databases** – Python provides interfaces to all major commercial databases.
- **GUI Programming** – Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.
- **Scalable** – Python provides a better structure and support for large programs than shell scripting.

VISUAL STUDIO CODE



Visual Studio Code is a source-code editor that can be used with a variety of programming languages, including C, C#, C++, Fortran, Go, Java, JavaScript, Node.js, Python, Rust.^{[16][17][18][19]} It is based on the Electron framework,^[20] which is used to develop Node.js web applications that run on the Blink layout engine. Visual Studio Code employs the same editor component (codenamed "Monaco") used in Azure DevOps (formerly called Visual Studio Online and Visual Studio Team Services).^[21]

Out of the box, Visual Studio Code includes basic support for most common programming languages. This basic support includes syntax highlighting, bracket matching, code folding, and configurable snippets. Visual Studio Code also ships with IntelliSense for JavaScript, TypeScript, JSON, CSS, and HTML, as well as debugging support for Node.js. Support for additional languages can be provided by freely available extensions on the VS Code Marketplace.

Instead of a project system, it allows users to open one or more directories, which can then be saved in workspaces for future reuse. This allows it to operate as a language-agnostic code editor for any language. It

supports many programming languages and a set of features that differs per language. Unwanted files and folders can be excluded from the project tree via the settings. Many Visual Studio Code features are not exposed through menus or the user interface but can be accessed via the command palette.

Visual Studio Code can be extended via extensions,^[24] available through a central repository. This includes additions to the editor^[25] and language support.^[23] A notable feature is the ability to create extensions that add support for new languages, themes, debuggers, time travel debuggers, perform static code analysis, and add code linters using the Language Server Protocol.

Hardware and Software Requirements

Hardware Requirements:	
RAM	2gb or above
HARD DISK	2gb or above
PROCESSOR	1.5 GHz or Higher Pentium-compatible CPU

Table-1

(Hardware Requirements)

Software Requirements:	
VISUAL STUDIO CODE	LATEST VERSION

Table-2

(Software Requirements)

Modules

Pytttsx3: A Text-To-Speech Converter for Python

pytttsx3 is a text-to-speech conversion library in Python. Unlike alternative libraries, it works offline and is compatible with both Python 2 and 3. An application invokes the `pytttsx3.init()` factory function to get a reference to a `pytttsx3`. Engine instance. it is a very easy to use tool which converts the entered text into speech. The `pytttsx3` module supports two voices first is female and the second is male which is provided by “sapi5” for windows.

Speech Recognition

Speech Recognition is an important feature in several applications used such as home automation, Artificial intelligence, etc. This article aims to provide an introduction to how to make use of the Speech Recognition library of Python. This is useful as it can be used on microcontrollers such as Raspberry Pi with the help of an external microphone

Date time

In Python, date and time are not a data type of their own, but a module named date time can be imported to work with the date as well as time. Python Date time module comes built into Python, so there is no need to install it externally.

Python Date time module supplies classes to work with date and time. These classes provide a number of functions to deal with dates, times and time intervals. Date and date time are an object in Python, so when you manipulate them, you are actually manipulating objects and not string or timestamps.

The Date Time module is categorized into 6 main classes –

- **date** – An idealized naive date, assuming the current Gregorian calendar always was, and always will be, in effect. Its attributes are year, month and day.
- **time** – An idealized time, independent of any particular day, assuming that every day has exactly 24*60*60 seconds. Its attributes are hour, minute, second, microsecond, and tzinfo.
- **date time** – Its a combination of date and time along with the attributes year, month, day, hour, minute, second, microsecond, and tzinfo.

- Time delta – A duration expressing the difference between two date, time, or datetime instances to microsecond resolution.
- tzinfo – It provides time zone information objects.

Wikipedia

The Internet is the single largest source of information, and therefore it is important to know how to fetch data from various sources. And with Wikipedia being one of the largest and most popular sources for information on the Internet.

Wikipedia is a multilingual online encyclopedia created and maintained as an open collaboration project by a community of volunteer editors using a wiki-based editing system. In this article, we will see how to use Python's Wikipedia module to fetch a variety of information from the Wikipedia website.

Web browser

In Python, web browser module is a convenient web browser controller. It provides a high-level interface that allows displaying Web-based documents to users.

Web browser can also be used as a CLI tool. It accepts a URL as the argument with the following optional parameters: -n opens the URL in a new browser window, if possible, and -t opens the URL in a new browser tab.

Being able to easily launch a browser can be a useful operation in many scripts. For example, maybe a script performs some kind of deployment to a server and one would like to have it quickly launch a browser so one can verify that it's working. Or maybe a program writes data out in the form of HTML pages and just like to fire up a browser to see the result. Either way, the *webbrowser module* is a simple solution

SMTPLIB

Simple Mail Transfer Protocol (SMTP) is a protocol, which handles sending e-mail and routing e-mail between mail servers.

Python provides `smtplib` module, which defines an SMTP client session object that can be used to send mail to any Internet machine with an SMTP or ESMTP listener daemon.

Here is the detail of the parameters –

- **host** – This is the host running your SMTP server. You can specify IP address of the host or a domain name like `tutorialspoint.com`. This is optional argument.
- **port** – If you are providing *host* argument, then you need to specify a port, where SMTP server is listening. Usually this port would be 25.
- **local_hostname** – If your SMTP server is running on your local machine, then you can specify just *localhost* as of this option.

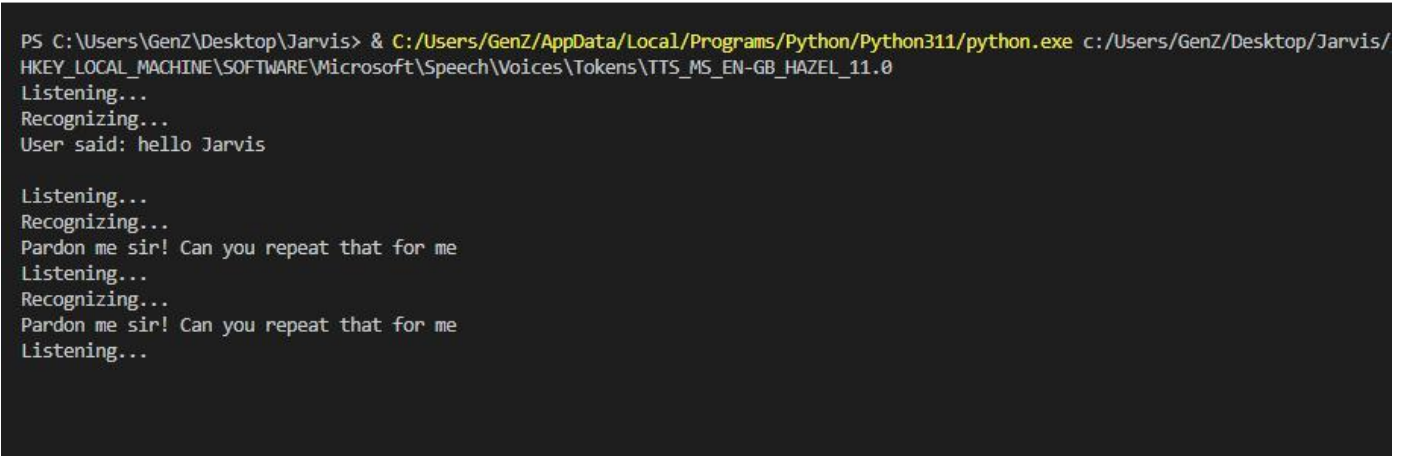
An SMTP object has an instance method called `sendmail`, which is typically used to do the work of mailing a message. It takes three parameters –

- The *sender* – A string with the address of the sender.
- The *receivers* – A list of strings, one for each recipient.
- The message – A message as a string formatted as specified in the various RFCs.

Pyjokes

Python supports creation of random jokes using one of its libraries. Let us explore it a little more, Pyjokes is a python library that is used to create one-line jokes for programmers. Informally, it can also be referred as a fun python library which is pretty simple to use. Let us see how you can actually use it to perform the required task

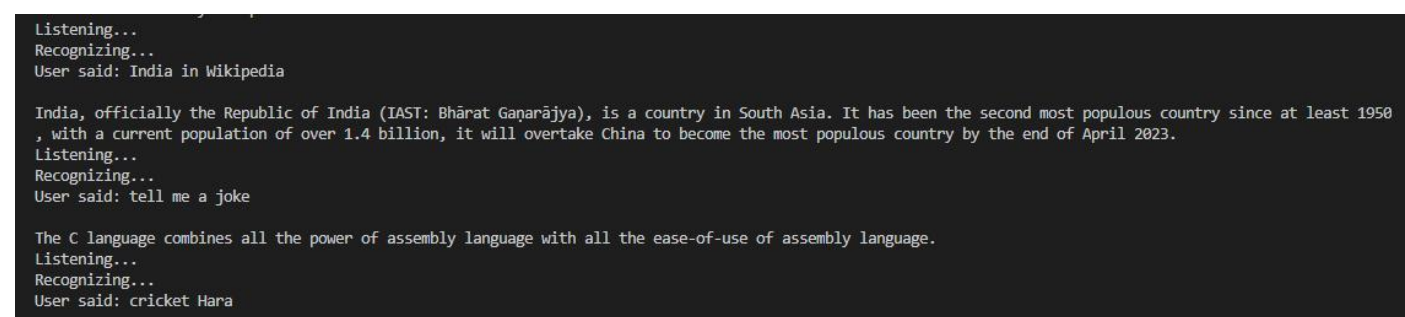
Screenshots



```
PS C:\Users\GenZ\Desktop\Jarvis> & C:/Users/GenZ/AppData/Local/Programs/Python/Python311/python.exe c:/Users/GenZ/Desktop/Jarvis/HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Speech\Voices\Tokens\TTS_MS_EN-GB_HAZEL_11.0
Listening...
Recognizing...
User said: hello Jarvis

Listening...
Recognizing...
Pardon me sir! Can you repeat that for me
Listening...
Recognizing...
Pardon me sir! Can you repeat that for me
Listening...
```

Figure 1: Greeting Voice Assistant



```
Listening...
Recognizing...
User said: India in Wikipedia

India, officially the Republic of India (IAST: Bhārat Gaṇarājya), is a country in South Asia. It has been the second most populous country since at least 1950, with a current population of over 1.4 billion, it will overtake China to become the most populous country by the end of April 2023.
Listening...
Recognizing...
User said: tell me a joke

The C language combines all the power of assembly language with all the ease-of-use of assembly language.
Listening...
Recognizing...
User said: cricket Hara
```

Figure 2: Wikipedia Search


```
Listening...
Recognizing...
User said: joke

.NET was named .NET so that it wouldn't show up in a Unix directory listing.
Listening...
Recognizing...
Pardon me sir! Can you repeat that for me
Listening...
Recognizing...
User said: hai
```

Figure 3: Joke with Jarvis

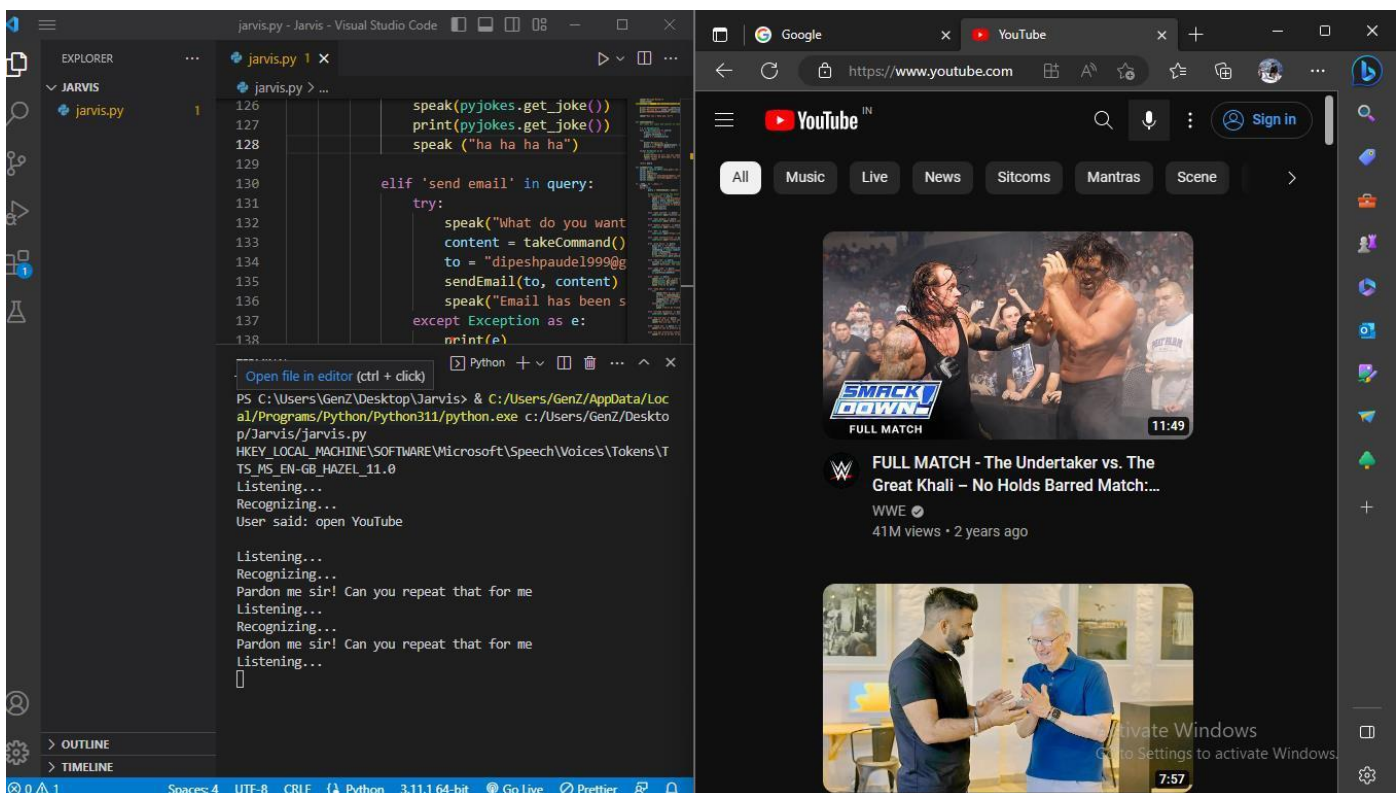


Figure 4: Opening YouTube with voice command

```

PS C:\Users\GenZ\Desktop\Jarvis> & C:/Users/GenZ/AppData/Local/Programs/Python/Python311/python.exe c:/Users/GenZ/Desktop/Jarvis/jarvis.py
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Speech\Voices\Tokens\TTS_MS_EN-GB_HAZEL_11.0
Listening...
Recognizing...
User said: open Google

Listening...
Recognizing...
Pardon me sir! Can you repeat that for me

```

Figure 5 : Opening Google

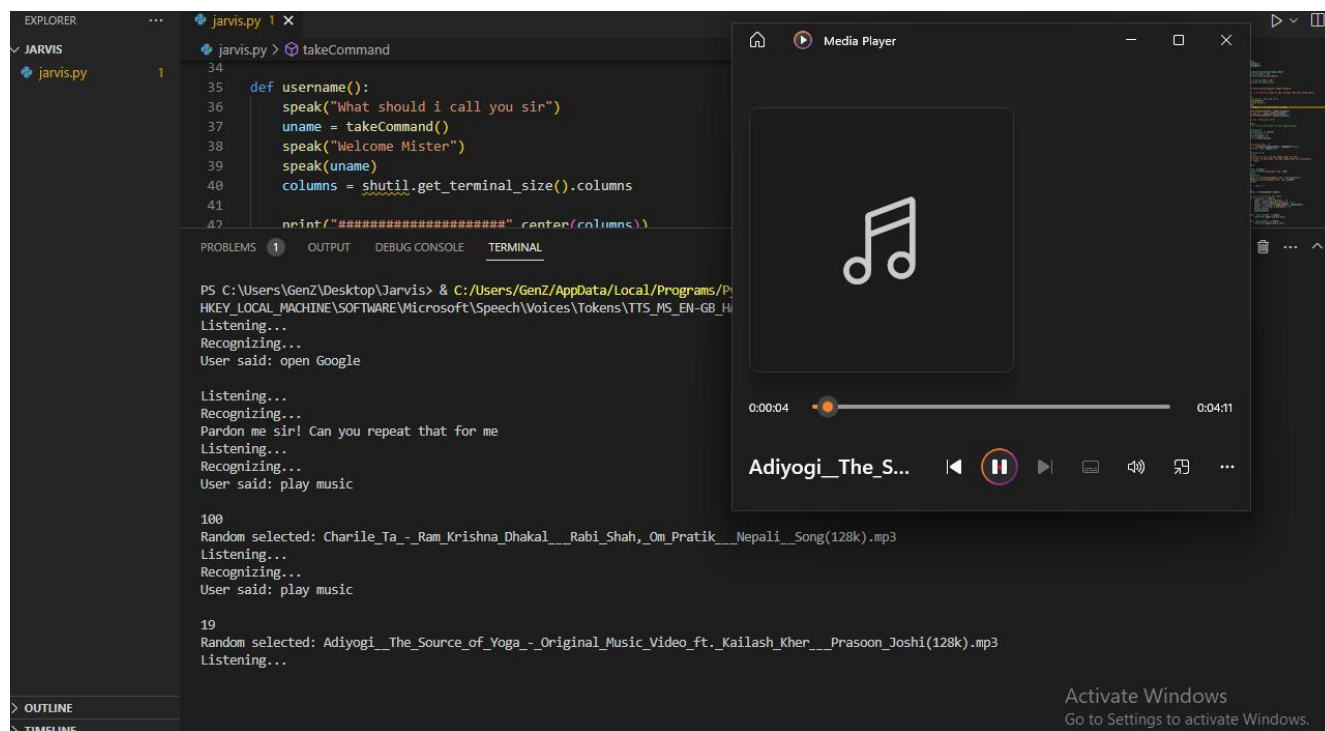


Figure 6: Playing Music with voice command by Jarvis

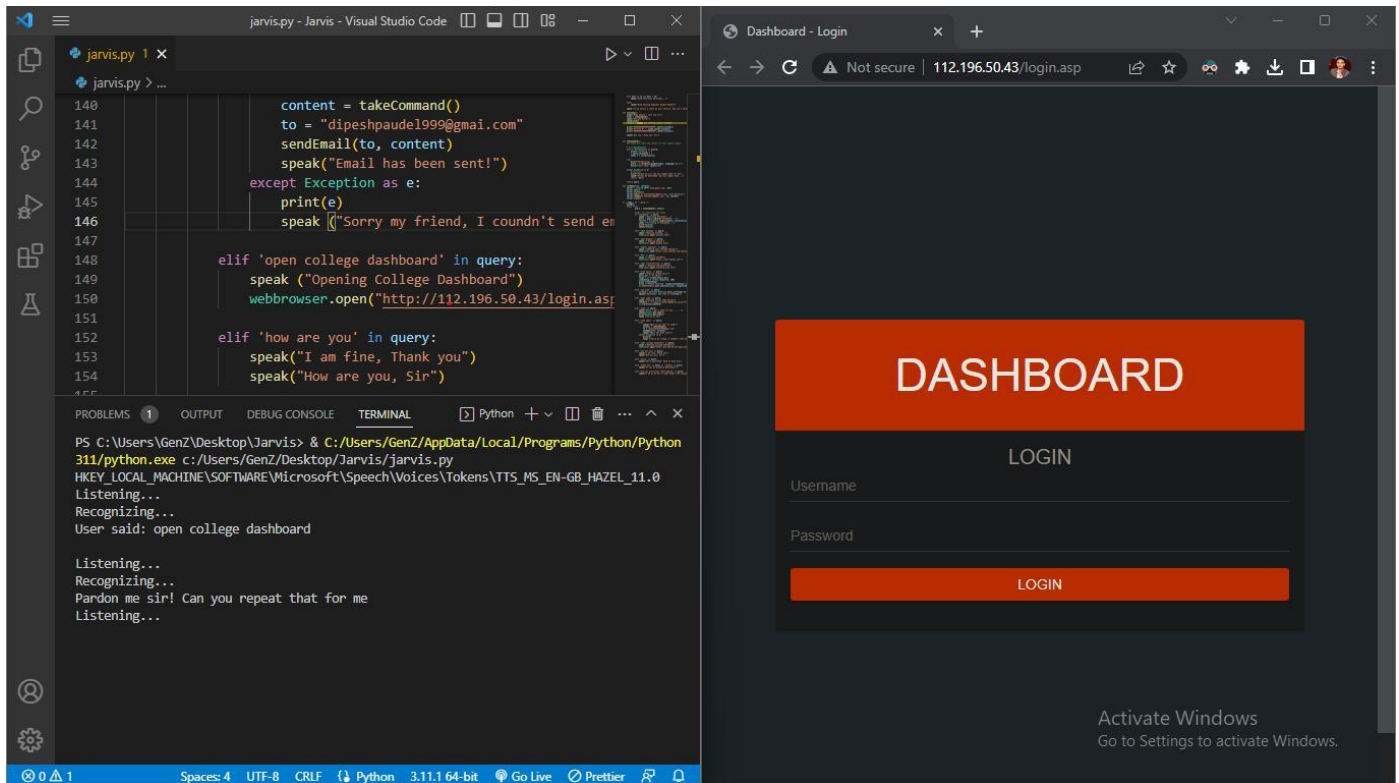


Figure 7: Opening College Dashboard

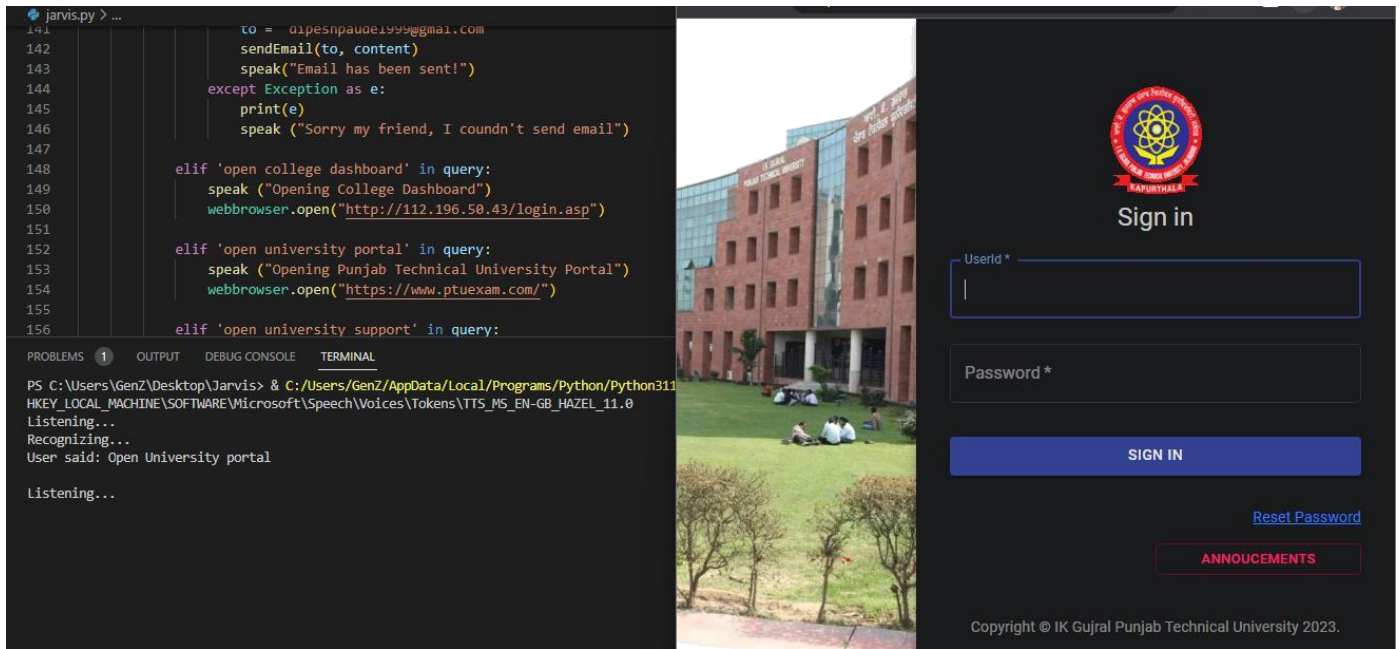


Figure 8: Opening Punjab Technical University Portal

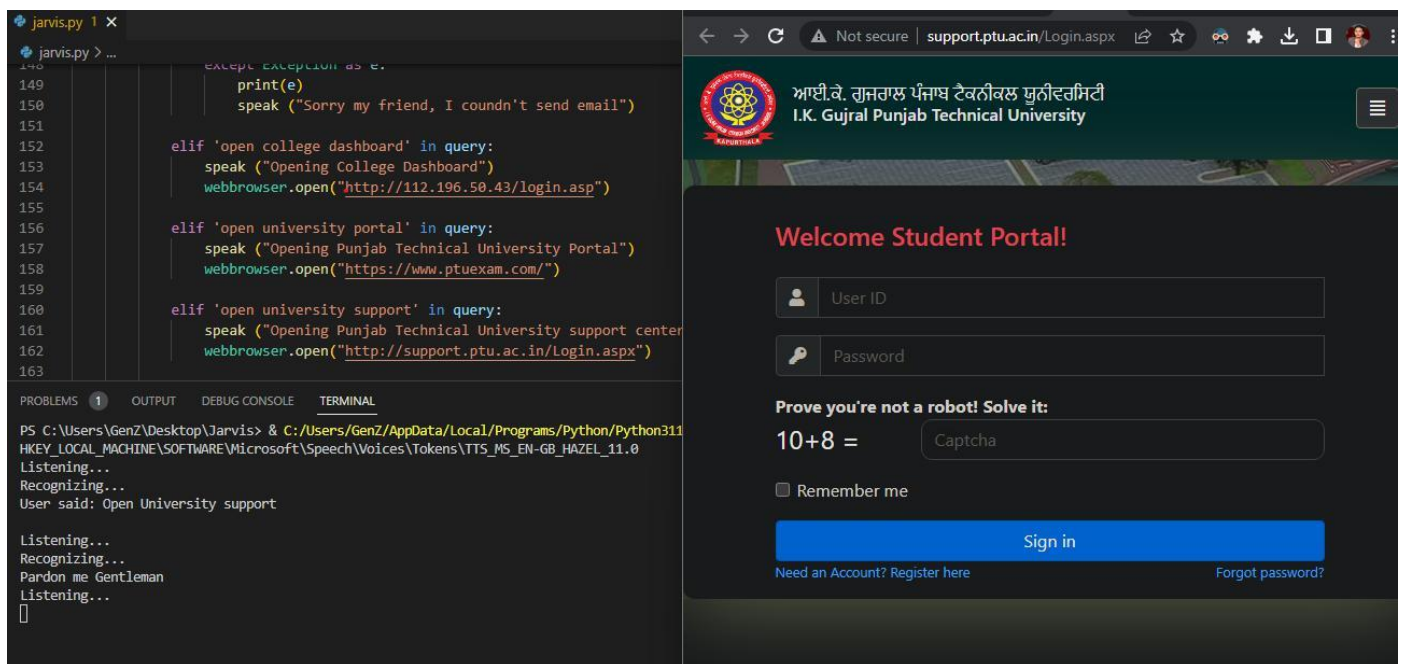


Figure 9: PTU Support Center

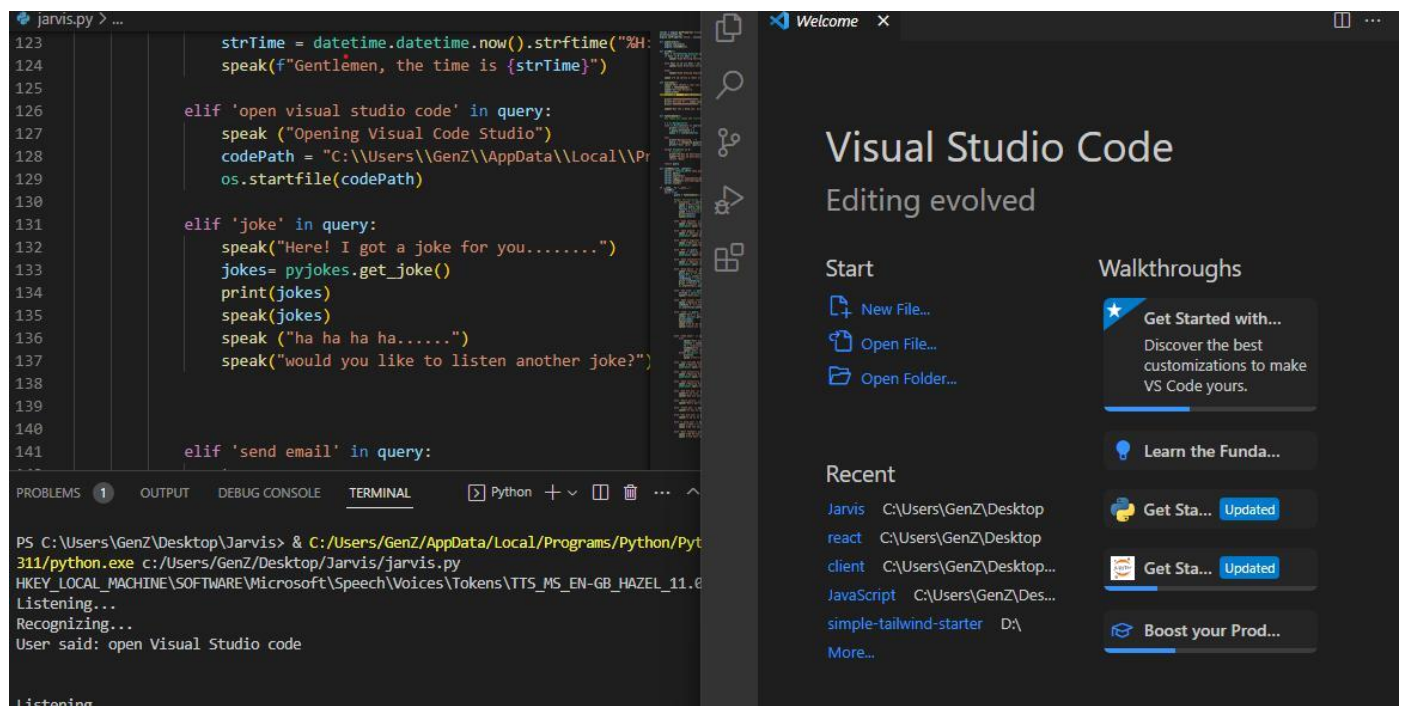


Figure 10: Opening Visual Studio

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1. www.youtube.com
2. <https://chat.openai.com/>
3. www.stackoverflow.com
4. <https://www.youtube.com/@clockspeed>.