**Modules Used and Their Purpose**

**1. Importing Required Libraries**

python

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import speech\_recognition as aa

import pyttsx3

import pywhatkit

import datetime

import wikipedia

* **speech\_recognition (as aa)** → Used to recognize and convert speech into text.
* **pyttsx3** → Used for text-to-speech (makes the assistant "speak").
* **pywhatkit** → Used to **play YouTube videos**.
* **datetime** → Used to **fetch the current time and date**.
* **wikipedia** → Used to **fetch short summaries** from Wikipedia.

**2. Setting Up the Assistant**

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listener = aa.Recognizer()

machine = pyttsx3.init()

* **listener = aa.Recognizer()**
  + Creates a recognizer object to **process voice input**.
* **machine = pyttsx3.init()**
  + Initializes the **text-to-speech engine**.

**3. Function to Make the Assistant Speak**

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def talk(text):

machine.say(text)

machine.runAndWait() # Run the speech synthesis

* **talk(text)** → This function allows the assistant to speak.
* **machine.say(text)** → Converts text into speech.
* **machine.runAndWait()** → Ensures the speech is finished before continuing execution.

📌 **Example:**

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talk("Hello, how are you?")

🎤 **Output:** "Hello, how are you?" (spoken by the assistant)

**4. Function to Take Voice Input**

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def input\_instruction():

try:

with aa.Microphone() as origin:

print("Listening...")

speech = listener.listen(origin)

instruction = listener.recognize\_google(speech)

instruction = instruction.lower()

if "jarvis" in instruction:

instruction = instruction.replace('jarvis', "").strip()

print("Recognized:", instruction)

return instruction

except:

return "" # Return empty string if no instruction is detected

**Step-by-Step Explanation:**

1. **with aa.Microphone() as origin:**
   * Uses the **microphone** to listen for the user’s voice.
2. **speech = listener.listen(origin)**
   * Listens to the user's speech and stores it.
3. **instruction = listener.recognize\_google(speech)**
   * Uses **Google's speech recognition API** to convert the speech into text.
4. **instruction = instruction.lower()**
   * Converts the instruction to **lowercase** to make processing easier.
5. **if "jarvis" in instruction:**
   * Checks if the user **mentioned "Jarvis"** in their command.
6. **instruction = instruction.replace('jarvis', "").strip()**
   * **Removes "Jarvis"** from the instruction so only the command remains.
7. **return instruction**
   * Returns the recognized command to be processed.
8. **except:**
   * If **no speech is detected**, it **returns an empty string ("")** to avoid errors.

📌 **Example Commands & Process:**

* **User says:** "Jarvis, play Despacito"
* **Processing:**

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instruction = "play despacito"

* **Recognized Output:** "Recognized: play despacito"

**5. Function to Execute Commands**

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def play\_jarvis():

while True: # Keep listening for commands

instruction = input\_instruction()

if instruction: # Only process if instruction is not empty

* **while True:**
  + Runs **an infinite loop** so the assistant keeps listening for commands.
* **instruction = input\_instruction()**
  + Calls the **voice input function** to get the command.
* **if instruction:**
  + Checks if an **instruction was actually received** (not empty).
  + If the user **didn’t say anything**, the loop repeats.

**6. Handling Different Commands**

**(a) Playing a YouTube Video**

python

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if "play" in instruction:

song = instruction.replace("play", "").strip()

talk("Playing " + song)

pywhatkit.playonyt(song)

* **Checks if the instruction contains "play".**
* **Extracts the song name** by removing "play".
* **The assistant speaks:** "Playing [song name]".
* **Opens YouTube** and plays the song.

📌 **Example Command:**

"Jarvis, play Shape of You"  
🎬 **Action:** Opens YouTube and plays "Shape of You".

**(b) Telling the Current Time**

python

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elif "time" in instruction:

time = datetime.datetime.now().strftime('%I:%M %p')

talk("Current time is " + time)

* **Gets the current time** in **hours & minutes** format (e.g., 10:30 AM).
* **The assistant speaks the time**.

📌 **Example Command:**

"Jarvis, what time is it?"  
⏰ **Response:** "Current time is 10:30 AM".

**(c) Telling the Date**

python

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elif "date" in instruction:

date = datetime.datetime.now().strftime("%d /%m /%Y")

talk("Today's date is " + date)

* **Gets the current date** in DD/MM/YYYY format.
* **The assistant speaks the date**.

📌 **Example Command:**

"Jarvis, what is today's date?"  
📅 **Response:** "Today's date is 14 / 03 / 2025".

**(d) Responding to "How are you?"**

python

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elif "how are you" in instruction:

talk("I am fine. What about you?")

* **Checks if the user asks "How are you?"**
* **The assistant responds politely**.

📌 **Example Command:**

"Jarvis, how are you?"  
💬 **Response:** "I am fine. What about you?"

**(e) Responding to "What is your name?"**

python

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elif "what is your name" in instruction:

talk("I am Jarvis, your assistant.")

* **If asked for a name,** the assistant replies with its identity.

📌 **Example Command:**

"Jarvis, what is your name?"  
🆔 **Response:** "I am Jarvis, your assistant."

**(f) Searching Wikipedia**

python

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elif "who is" in instruction:

human = instruction.replace('who is', "").strip()

info = wikipedia.summary(human, 1)

print(info)

talk(info)

* **Extracts the person's name** from the command.
* **Searches Wikipedia** for a **short summary** (1 sentence).
* **Reads the information aloud**.

📌 **Example Command:**

"Jarvis, who is Albert Einstein?"  
📖 **Response:** "Albert Einstein was a German-born theoretical physicist who developed the theory of relativity."

**(g) Default Response**

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else:

talk("Please repeat.")

* **If the command is unrecognized,** the assistant asks the user to repeat.

**7. Running the Assistant**

python

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play\_jarvis()

* **Calls the function** to start the assistant.
* **Runs indefinitely**, listening for commands.

**Final Thoughts**

✅ **Plays YouTube videos** 🎶  
✅ **Tells the time & date** ⏰  
✅ **Answers basic questions** 💬  
✅ **Searches Wikipedia** 📖  
✅ **Continuously listens for commands** 🎙

This is a great **voice assistant project!** 🚀 Let me know if you want to **add more features** like opening websites, weather updates, or system controls. 😊