

Practical—1

- ✚ Implement a program to demonstrate AI components, categorization of intelligent systems, and application in real-world case studies.

1. AI Components:

1.1. **Knowledge Representation:**

Simulated using pre-defined rules in the chatbot — the system interprets user input and gives responses based on stored linguistic patterns.

1.2. **Reasoning:**

The chatbot and surveillance alert system use **conditional logic** (if-else) to make decisions or conclusions, simulating basic reasoning.

1.3. **Machine Learning:**

A basic supervised ML model using the Iris dataset is used to predict classes (used as a placeholder for disease prediction).

1.4. **Natural Language Processing (NLP):**

NLTK is used to tokenize user input in the chatbot. This simulates how AI systems break down and understand human language.

1.5. **Perception (Simulated):**

The surveillance alert system mimics environmental perception using randomly generated alerts like "motion detected", simulating real-time sensor data handling.

2. Categories of Intelligent Systems:

Category	Description
Reactive Machines	These systems respond to specific inputs with fixed outputs. No memory of the past is used.
Limited Memory	These systems can use past information to make decisions.
Theory of Mind	Hypothetical systems that understand emotions, beliefs, intentions.
Self-aware	Future systems that are conscious and understand themselves.

Input :

```
import random

def chatbot(user_input):

    user_input = user_input.lower()

    if "hello" in user_input or "hi" in user_input:

        return "Hi there! How can I help?"

    elif "problem" in user_input:

        return "Please explain your problem."

    elif "bye" in user_input:

        return "Goodbye!"

    else:

        return "Sorry, I didn't understand."


def fake_ml_prediction():

    diseases = ["Cold", "Flu", "Allergy"]

    prediction = random.choice(diseases)

    print("\n[ML] Predicted Disease:", prediction)


def perception_simulator():

    alerts = ["normal", "motion detected", "sound detected"]

    alert = random.choice(alerts)
```

```
print("\n[Surveillance] Status:", alert)

if alert != "normal":

    print("[Alert] Suspicious activity!")

else:

    print("[Info] All clear.")


def main():

    print("==== Simple AI Demo ====")


    print("\n1. Chatbot")

    while True:

        msg = input("You: ")

        if msg.lower() == "exit":

            break

        print("Bot:", chatbot(msg))

    print("\n2. Disease Prediction")

    fake_ml_prediction()

    print("\n3. Perception Simulation")

    perception_simulator()

    print("\n✅ Done!")


if __name__ == "__main__":

    main()
```

Output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\Sem5\AI> & C:/Python313/python.exe d:/Sem5/AI/pac-1.py
=== Simple AI Demo ===

1. Chatbot
You: hi
Bot: Hi there! How can I help?
You: problem
Bot: Please explain your problem.
You: ye
Bot: Sorry, I didn't understand.
You: bye
Bot: Goodbye!
You: exit
Bot: Bye!

2. Disease Prediction

[ML] Predicted Disease: Cold

3. Perception Simulation

[Surveillance] Status: sound detected
[Alert] Suspicious activity!

✅ Done!
PS D:\Sem5\AI> █
```