Republic of the Philippines
Laguna State Polytechnic University
Province of Laguna

Machine Problem No. 3			
Topic:	**Rule-Based Reasoning and Expert Systems**	**Week No.**	8
Course Code:	**CSST101**	**Term:**	1st Semester
Course Title:	**Advance Knowledge Representation and Reasoning**	**Academic Year:**	2025-2026
Student Name		**Section**	
Due date		**Points**	

Topic: Rule-Based Reasoning and Expert Systems

Objectives

At the end of this laboratory activity, the student should be able to:

1. Apply the principles of rule-based reasoning using *if–then* rules in R.
2. Simulate an expert system using R programming.
3. Demonstrate logical inference through forward reasoning.
4. Create a user-interactive decision-making program in R.

Problem Description

Design and implement a **Rule-Based Expert System in R** that provides recommendations or diagnoses based on user input.

Your program should use **conditional rules (if–else or switch)** to simulate an inference engine that gives meaningful advice.

You may choose **one (1)** from the following application domains **or propose your own** (subject to instructor approval):

1. **Health Advisor** – Suggests possible illnesses based on symptoms.
2. **Weather-Based Outfit Recommender** – Suggests clothing or gear based on weather conditions.
3. **Travel Planner** – Suggests destinations or activities based on user preferences.
4. **Computer Troubleshooting Assistant** – Provides solutions based on common PC problems.
5. **Study Habit Coach** – Gives advice based on student schedules and habits.

Program Requirements

1. Use **at least five (5) rules** in the program (using if–else or switch).
2. The system must **accept user input** (via readline() function).
3. The program should display **logical, rule-based outputs**.
4. Implement at least **one chained rule** (a rule that depends on the result of another rule).
5. Provide **clear and formatted output** (include conditions and conclusions).
6. Use **comments (#)** to explain the logic in your code.

Sample Run 1 – Health Advisor

```
Enter weather condition (sunny/rainy/cold): rainy
Temperature in Celsius: 25
Recommendation: Bring an umbrella and wear a light jacket.
```

Sample Run 2 – Weather Recommender

```
Enter weather condition (sunny/rainy/cold): rainy
Temperature in Celsius: 25
Recommendation: Bring an umbrella and wear a light jacket.
```

Hint: Suggested R Code Structure

```
symptom <- readline(prompt = "Enter your symptom: ")

if (symptom == "fever") {
  cough <- readline(prompt = "Do you also have cough? (yes/no): ")
  if (cough == "yes") {
    print("Possible cause: You may have the flu.")
  } else {
    print("Possible cause: You may have an infection.")
  }
} else if (symptom == "headache") {
  print("Possible cause: Dehydration or stress.")
} else {
  print("Consult a medical professional for further diagnosis.")
}
```

Submission Guidelines

1. Save your program as:
   MP8_<LastName>_<ApplicationName>.R
   (Example: MP8_Bernardino_HealthAdvisor.R)
2. Include:
   - Your name and section in program comments
   - At least two screenshots showing program execution
3. Submit both your .R file and screenshots via your Github Account.

Evaluation Criteria

Criteria	Description	Points
Correctness	Program runs without errors and meets requirements	30
Rule Implementation	Uses appropriate and logical if–then rules	25
User Interaction	Accepts input and produces clear, accurate results	20
Code Readability	Well-commented and properly indented	15
Creativity	Unique or innovative application of rule-based reasoning	10
Total		**100**