Assignment 2 - Rule-Based Systems in Artificial Intelligence

Objective: To understand and implement rule-based AI systems using conditional logic in Python.  
Each student must choose at least one use case and write a Python program that uses IF-THEN rules to simulate intelligent behavior. You may optionally enhance your solution with menus, user input validation, or data storage.

# Use Cases (Choose any one)

## 1. Vacuum Cleaner Agent

Simulate a simple environment with two rooms (A and B). The vacuum cleaner must clean the rooms based on their dirt status.  
Rules Example:  
- If location is 'A' and room A is dirty → Clean  
- Else if location is 'A' and room A is clean → Move to B  
- Repeat until both rooms are clean.

ANS:

#Loan Approval System

def loan\_approval():

inc=int(input("Enter the income: "))

cred=int(input("Enter the credit score"))

if inc>50000 and cred>700:

print("Loan approved!")

elif inc<30000 and cred<60:

print("Loan rejected.")

else:

print("Further Review")

loan\_approval()

print("Main program ends")

## 2. Loan Approval System

Create a program to decide if a loan should be approved based on user's income and credit score.  
Rules Example:  
- If income > 50000 and credit score > 700 → Approve  
- If income < 30000 and credit score < 600 → Reject  
- Else → Further Review

ANS:

#Chatbot for Library hours

def libr\_assistant():

ques=input("How may I help you?")

if ques=="What are library hours?":

print(lib\_hrs)

elif ques=="Can I borrow books?":

print(bor\_book)

else:

print("We will get back to you in a moment.")

lib\_hrs=["Library is open from 9 AM to 5 PM."]

bor\_book=["Yes, up to 3 books."]

libr\_assistant()

## 3. Student Grade Classification

Build a grading system that assigns grades based on average marks.  
Rules Example:  
- Average >= 90 → Grade A  
- 75 <= Average < 90 → Grade B  
- 50 <= Average < 75 → Grade C  
- Else → Fail

## 4. Chatbot for Library Assistant

Create a basic chatbot that answers simple library-related questions using rule-based responses.  
Rules Example:  
- If input is 'What are library hours?' → 'Library is open from 9 AM to 5 PM'  
- If input is 'Can I borrow books?' → 'Yes, up to 3 books.'

## 5. Weather-Based Clothing Suggestion

Write a program to suggest clothing based on the weather temperature input.  
Rules Example:  
- Temp < 10 → Wear a jacket  
- 10 <= Temp <= 25 → Wear a hoodie  
- Temp > 25 → Wear light clothes