from collections import defaultdict

class ExpertSystem:

def \_\_init\_\_(self):

self.rules = defaultdict(list)

self.facts = {}

def add\_rule(self, condition, action):

self.rules[tuple(condition.items())].append(action)

def set\_fact(self, fact, value):

self.facts[fact] = value

def execute(self):

for condition, actions in self.rules.items():

if all(self.facts.get(fact) == value for fact, value in condition):

for action in actions:

action()

# Example usage

if \_\_name\_\_ == "\_\_main\_\_":

expert\_system = ExpertSystem()

# Define rules and actions

condition1 = {'symptom': 'fever', 'duration': 'long'}

action1 = lambda: print("This patient needs further investigation.")

condition2 = {'symptom': 'cough', 'duration': 'short'}

action2 = lambda: print("This patient may have a common cold.")

condition3 = {'symptom': 'cough', 'duration': 'long'}

action3 = lambda: print("This patient may have bronchitis.")

# Add rules to the expert system

expert\_system.add\_rule(condition1, action1)

expert\_system.add\_rule(condition2, action2)

expert\_system.add\_rule(condition3, action3)

# Take input for facts

symptom = input("Enter the symptom: ")

duration = input("Enter the duration: ")

# Set the facts

expert\_system.set\_fact('symptom', symptom)

expert\_system.set\_fact('duration', duration)

# Execute the expert system

expert\_system.execute()