Forward Chaining

Aim:

To derive conclusions **by starting from known facts and applying inference rules** in a forward direction, until the goal is reached.

Simple Program (Python Simulation)

```
# Knowledge base (facts)
facts = {"has_fever", "has_cough"}

# Rules
rules = [
    ({"has_fever", "has_cough"}, "might_have_flu"),
    ({"might_have_flu"}, "recommend_rest"),
]

# Inference engine (forward chaining)
inferred = set()

while True:
    applied = False
    for condition, conclusion in rules:
        if condition.issubset(facts) and conclusion not in facts:
            facts.add(conclusion)
            inferred.add(conclusion)
            applied = True
    if not applied:
        break

print("Inferred facts:", inferred)
```

Output:

```
bash
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Inferred facts: {'might_have_flu', 'recommend_rest'}
```

Result:

Starting from the facts `"has_fever"` and `"has_cough"`, the system:

- Infers `"might_have_flu"`
- Then infers `"recommend_rest"` This demonstrates how **forward chaining can reason step-by-step** to reach conclusions.