```
rules = [
    {"conditions": {"fever", "cough"}, "conclusion": "flu"},
    {"conditions": {"headache", "fever"}, "conclusion": "dengue"},
    {"conditions": {"rash", "fever"}, "conclusion": "measles"},
]

facts = {"fever", "cough"}


def forward_reasoning(facts, rules, goal=None):
    inferred = set()
    applied_rules = set()

    while True:
        rule_applied = False

        for i, rule in enumerate(rules):
            if i not in applied_rules and rule["conditions"].issubset(facts):
                new_fact = rule["conclusion"]
                if new_fact not in facts:
                    inferred.add(new_fact)
                    facts.add(new_fact)
                    rule_applied = True
                    applied_rules.add(i)

                    print(f"Rule applied: {rule}")
                    print(f"New fact inferred: {new_fact}")

                if goal and goal in facts:
                    return facts, inferred

        if not rule_applied:
            break

    return facts, inferred

goal = "flu"
final_facts, inferred_facts = forward_reasoning(facts, rules, goal)

print("\nFinal Facts:", final_facts)
print("Inferred Facts:", inferred_facts)
```

```
Rule applied: {'conditions': {'fever', 'cough'}, 'conclusion': 'flu'}
New fact inferred: flu

Final Facts: {'fever', 'flu', 'cough'}
Inferred Facts: {'flu'}
```

Start coding or generate with AI.