

PRINCIPLES OF ARTIFICIAL INTELLIGENCE LAB –

EXPERIMENT 8: FORWARD CHAINING

```
# Knowledge Base: Rules in IF-THEN format knowledge_base
```

```
= [  
    (["cough", "fever"], "flu"),  
    (["sore_throat", "runny_nose"], "cold"),  
    (["sore_throat"], "fever") # Sore throat can lead to fever  
]
```

```
# Given initial facts facts =
```

```
{"cough", "sore_throat"}
```

```
# Forward Chaining Function def
```

```
forward_chaining():
```

```
    inferred = True # Keep looping as long as new facts are added
```

```
    while inferred:
```

```
        inferred = False # Stop if no new fact is added in an iteration
```

```
        for conditions, conclusion in knowledge_base:            if all(condition in facts for  
condition in conditions) and conclusion not in facts:
```

```
            facts.add(conclusion) # Add the inferred fact
```

```
        inferred = True # Mark that we inferred a new fact
```

```
# Run forward chaining forward_chaining()
```

Check if flu or cold is inferred if

"flu" in facts:

```
print("The patient is diagnosed with flu.") elif
```

"cold" in facts:

```
print("The patient is diagnosed with cold.")
```

```
else: print("No conclusive diagnosis could be  
made.")
```

The screenshot shows a web browser window with the Programiz Python Online Compiler. The code in the editor is as follows:

```
18+ for conditions, conclusion in knowledge_base:
19+     if all(condition in facts for condition in
20+           conditions) and conclusion not in facts:
21+         facts.add(conclusion) # Add the inferred fact
22+         inferred = True # Mark that we inferred a new
23+         fact
24+ # Run forward chaining
25+ forward_chaining()
26+ # Check if flu or cold is inferred
27+ if "flu" in facts:
28+     print("The patient is diagnosed with flu.")
29+ elif "cold" in facts:
30+     print("The patient is diagnosed with cold.")
31+ else:
32+     print("No conclusive diagnosis could be made.")
```

The output window on the right displays the result of the execution:

```
The patient is diagnosed with flu.
=== Code Execution Successful ===
```

The browser's address bar shows the URL `programiz.com/python-programming/online-compiler/`. The top of the page features the Programiz logo and navigation links for "Premium Coding Courses by Programiz" and "Programiz PRO".

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