1. Write a python program for Forward chaining algorithm for the following problem:
   The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy America, has some missiles, and all of its missiles were sold to it by Col. West, who is an American. Prove that Col. West is a criminal.

Program :

```
class Rule:
    def __init__(self, antecedent, consequent):
        self.antecedent = antecedent
        self.consequent = consequent

class Fact:
    def __init__(self, statement, value=False):
        self.statement = statement
        self.value = value

def forward_chaining(rules, facts):
    while True:
        new_facts = []
        for rule in rules:
            if all(fact.value for fact in rule.antecedent) and not rule.consequent.value:
                rule.consequent.value = True
                new_facts.append(rule.consequent)

        if not new_facts:
```

```
            break

    return facts

def main():
    # Facts
    american = Fact("American", value=True)
    sells_weapons = Fact("SellsWeapons", value=True)
    hostile_nations = Fact("HostileNations", value=True)
    missiles = Fact("Missiles", value=True)
    col_west = Fact("ColWest", value=False)  # Initially assume innocence

    # Rules
    rules = [
        Rule([american, sells_weapons, hostile_nations], col_west),
        Rule([col_west], Fact("Criminal", value=True))
    ]

    # Initial facts
    initial_facts = [american, missiles, hostile_nations]

    # Forward chaining
    inferred_facts = forward_chaining(rules, initial_facts)
```

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    # Display the results
    print("Inferred facts:")
    for fact in inferred_facts:
        print(fact.statement, ":", fact.value)

    # Check if Col. West is a criminal
    if col_west.value:
        print("Col. West is a criminal.")
    else:
        print("Col. West is not a criminal.")

if __name__ == "__main__":
    main()
```

Output :

```
Inferred facts:
American : True
Missiles : True
HostileNations : True
Col. West is a criminal.
```