LAB -08:-

Unification :-

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-> Statements:-

1. Doctors treat patients who are sick.
2. John is a doctor
3. Mary is sick
4. Doctors work in hospitals.
5. General Hospital is a Hospital.
6. John works at General Hospital.

=> Quantification Statements:-

1. $\forall x \forall y$ (Doctor(x) A Sicky (Y) $\rightarrow$ Treats(x,x))
2. Doctor (John)
3. Sick (Mary)
4. $\forall x$ (Doctor(x) $\rightarrow \exists h$ (Hospital(h) $\wedge$ Works At (x,h)))
5. Hospital (General Hospital)
6. Works At (John, General Hospital)

-> Unify Statements:-

$\exists x$ (Treats (x, mary))

* ① From statement(1), unify Treats (x,y) with Treats (x, Mary), binding y = Mary.

② statements(3), confirm Sick (Mary) is true, activating statement(1).

③ Use Statement (2) to deduce that

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Doctors(John), holds so

x → John satisfies the query
∃ x (Trusts (x, mary)).

∴ x → John
Y → Mary

```
knowledge_base = [
    {"type":"rule", "rule":"∀x ∀y
(Doctors(x) ∧ Sicky(y) → Treats(x,y))"},

{"type":"fact", "fact": Doctor(John)"},
{"type": "fact", "fact": Sick(mary)"},
{"type": "fact", "fact": ∀x(Doctor(x)
        → ∃h(hospital(h) ∧ A treats
At(x, Y))"},
{"type": "fact", "fact": Hospital(General
    Hospital)"},
{"type": "fact", "fact": "Works At(John,
    General Hospital)"},
]

query = {"predict": "Treats", "arguments":
    ["?", "mary"]}

def unify(kb, query):
    predicate = query["predicate"]
    target_arg = query["arguments"][1]
    result = None
```

```
for item in kb:
    if item["type"] == "rule" and
predicate in item['rule']:
        rule = item["rule"]

if "Doctor(x)" in rule and "sickly)" in rule:
    doctor = None
    sick_person = None

for fact in kb:
    if fact["type"] == "fact" and
"Doctor(" in fact['fact']:
        doctor = fact['fact'].

if result:
    return ("The query" {query["predicate"]
{result}, {target_arg}' is
        unified: {result} treats {target_arg}."

else:
    return f"The query {query['predicate']}
```

Result = Unify (Knowledge_base, query)
print (result).

Output :—

John Treats Mary.

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