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IMPLEMENTATION OF UNIFICATION AND RESOLUTION

ALGORITHM

```
*python.py - C:/Users/admin/Downloads/python.py (3.10.8)*
File Edit Format Run Options Window Help

import re

def unify(x, y, theta={}):
    if theta is None:
        return None
    elif x == y:
        return theta
    elif isinstance(x, str) and x.islower():
        return unify_var(x, y, theta)
    elif isinstance(y, str) and y.islower():
        return unify_var(y, x, theta)
    elif isinstance(x, list) and isinstance(y, list) and len(x) == len(y):
        return unify(x[1:], y[1:], unify(x[0], y[0], theta))
    else:
        return None

def unify_var(var, x, theta):
    if var in theta:
        return unify(theta[var], x, theta)
    elif x in theta:
        return unify(var, theta[x], theta)
    else:
        theta[var] = x
        return theta

def resolution(kb, query):
    for clause in kb:
        if query in clause:
            return True

        theta = unify(clause[0], query, {})
        if theta is not None:
            new_kb = clause[1:]
            if not new_kb:
                return True
            else:
                return resolution(kb, new_kb[0])

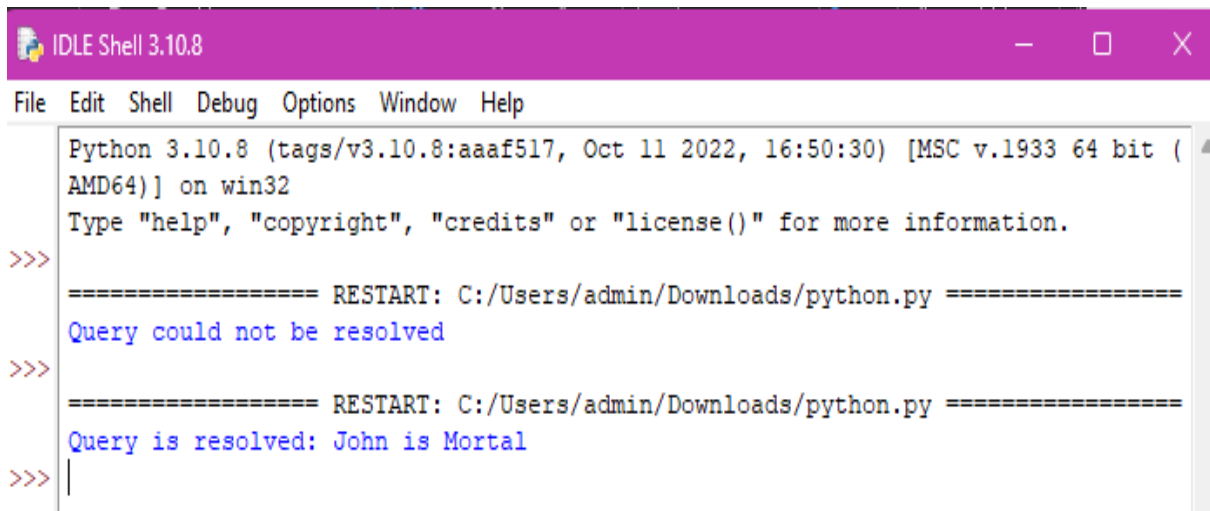
    return False

knowledge_base = [
    [{"Human", "John"}, {"Mortal", "John"}]
]

fact = ["Human", "John"]

query = ["Mortal", "John"]

if resolution(knowledge_base, query):
    print("Query is resolved: John is Mortal")
else:
    print("Query could not be resolved")
```

A screenshot of the Python IDLE Shell 3.10.8 window. The title bar is blue and contains the text "IDLE Shell 3.10.8" and standard window control buttons. The menu bar includes "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The main text area shows the Python 3.10.8 startup message, followed by two restart messages and two lines of user input. The first restart message is "RESTART: C:/Users/admin/Downloads/python.py" followed by "Query could not be resolved". The second restart message is "RESTART: C:/Users/admin/Downloads/python.py" followed by "Query is resolved: John is Mortal". The prompt ">>>" is visible on the left side of the text area.

```
IDLE Shell 3.10.8
File Edit Shell Debug Options Window Help
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/admin/Downloads/python.py =====
Query could not be resolved
>>>
===== RESTART: C:/Users/admin/Downloads/python.py =====
Query is resolved: John is Mortal
>>> |
```