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IMPLEMENTATION OF UNIFICATION AND RESOLUTION ALGORITHM

python.py - C:/Users/admin/Downloads/python.py (3.10.8)

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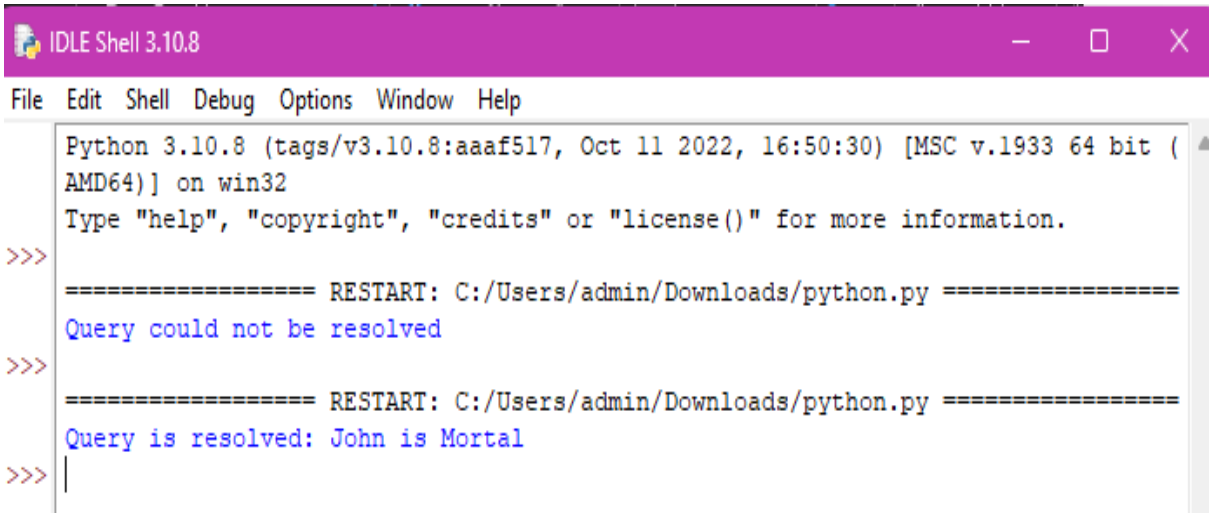
```
import re


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")
```


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
>>>