AI Lab Assignment

Assignment 2: Implement Unification Algorithms for real life example.

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```
#Unification algorithm implementation in solving linear equations using
#matrix
import numpy as np


def solution_equations(A,B,X):
    """
    Solve a linear matrix equation, or system of linear
    Scalar equations.
    """

    solution = np.linalg.inv(A).dot(B)
    return solution



def unify(X,values):
    req_substitutions={}
    for i in range(len(X)):
        req_substitutions[X[i]]=values[i]
    return req_substitutions

def main():
    """
    The main driving function of the program, this takes the
    input equations from user and also call the further
    required functions for the program execution
    """
```

```
n=int(input("Enter the number of variables in the equaation: "))
#n variable equations
X=[]

for i in range(n):
    x = input("Enter the name of variable: ")
    X.append(x)

A=np.zeros((n,n))
#initialising the coeficient matrix of n equations to
#solve n variable equations

print("Enter coeficient with proper sign and order as ",X)
B=[]

for i in range(n):
    A[i] = list(map(int, input("Enter the LHS coefficients
           of equation with spaces: ").split()))
    #inputing one equation in one line on LHS side

    b = float(input("Enter the constant on RHS of equation: "))
    #constant of that equation on RHS side
    B.append(b)

X=np.array(X)
B=np.array(B)
#converting lists into np array

values=solution_equations(A,B,X)
#finding solutions of that equations

print("Hence, the required substitution for unifying these
       equations simoultaneously: ", unify(X,values))

return
```

```
main()

#Main function
```

Output:

```
Enter the number of variables in the equation: 2
Enter the name of variable: a
Enter the name of variable: b
Enter coefficient with proper sign and order as  ['a', 'b']
Enter the LHS coefficients of equation with spaces: 1 1
Enter the constant on RHS of equation: 10
Enter the LHS coefficients of equation with spaces: 1 -1
Enter the constant on RHS of equation: 8
Hence, the required substitution for unifying these equations
simultaneously:  {'a': 9.0, 'b': 1.0}
```