**LAB 7:**

**Program:** Unification inFirst Order Logic

**Code:**

def unify(term1, term2, substitution=None):

    if substitution is None:

        substitution = {}

    if term1 == term2:

        return substitution

    elif is\_variable(term1):

        return unify\_variable(term1, term2, substitution)

    elif is\_variable(term2):

        return unify\_variable(term2, term1, substitution)

    elif is\_function(term1) and is\_function(term2):

        if term1[0] != term2[0]:

            return None

        else:

            for arg1, arg2 in zip(term1[1:], term2[1:]):

                substitution = unify(arg1, arg2, substitution)

                if substitution is None:

                    return None

            return substitution

    else:

        return None

def unify\_variable(variable, term, substitution):

    if variable in substitution:

        return unify(substitution[variable], term, substitution)

    if term == variable:

        return substitution

    substitution[variable] = term

    return substitution

def is\_variable(term):

    return isinstance(term, str) and term.islower()

def is\_function(term):

    return isinstance(term, tuple) and len(term) > 1

term1 = ("Loves", "x", "Mary")

term2 = ("Loves", "John", "Mary")

substitution = unify(term1, term2)

if substitution is not None:

    print("Unification successful, substitution:", substitution)

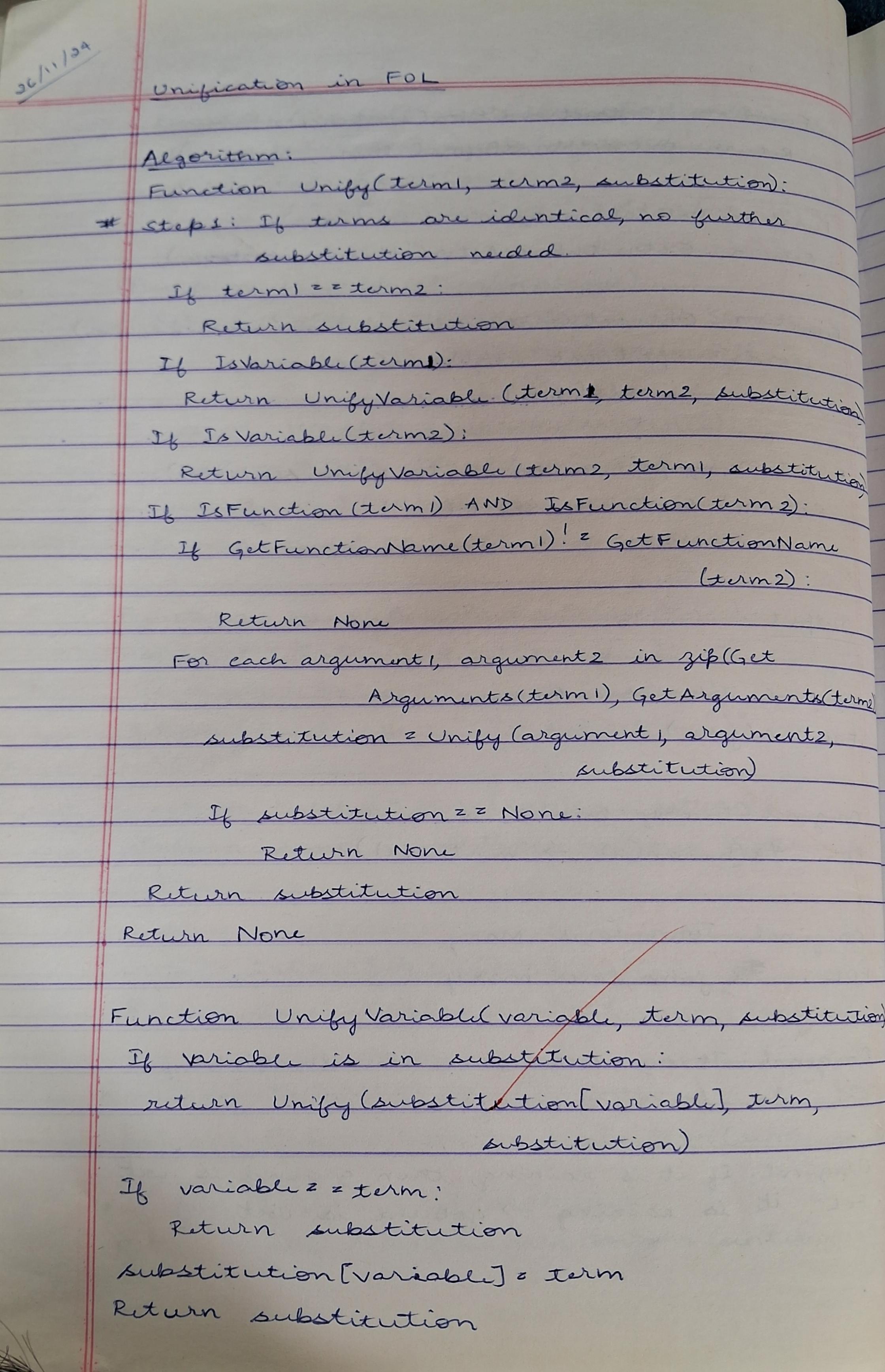
else:

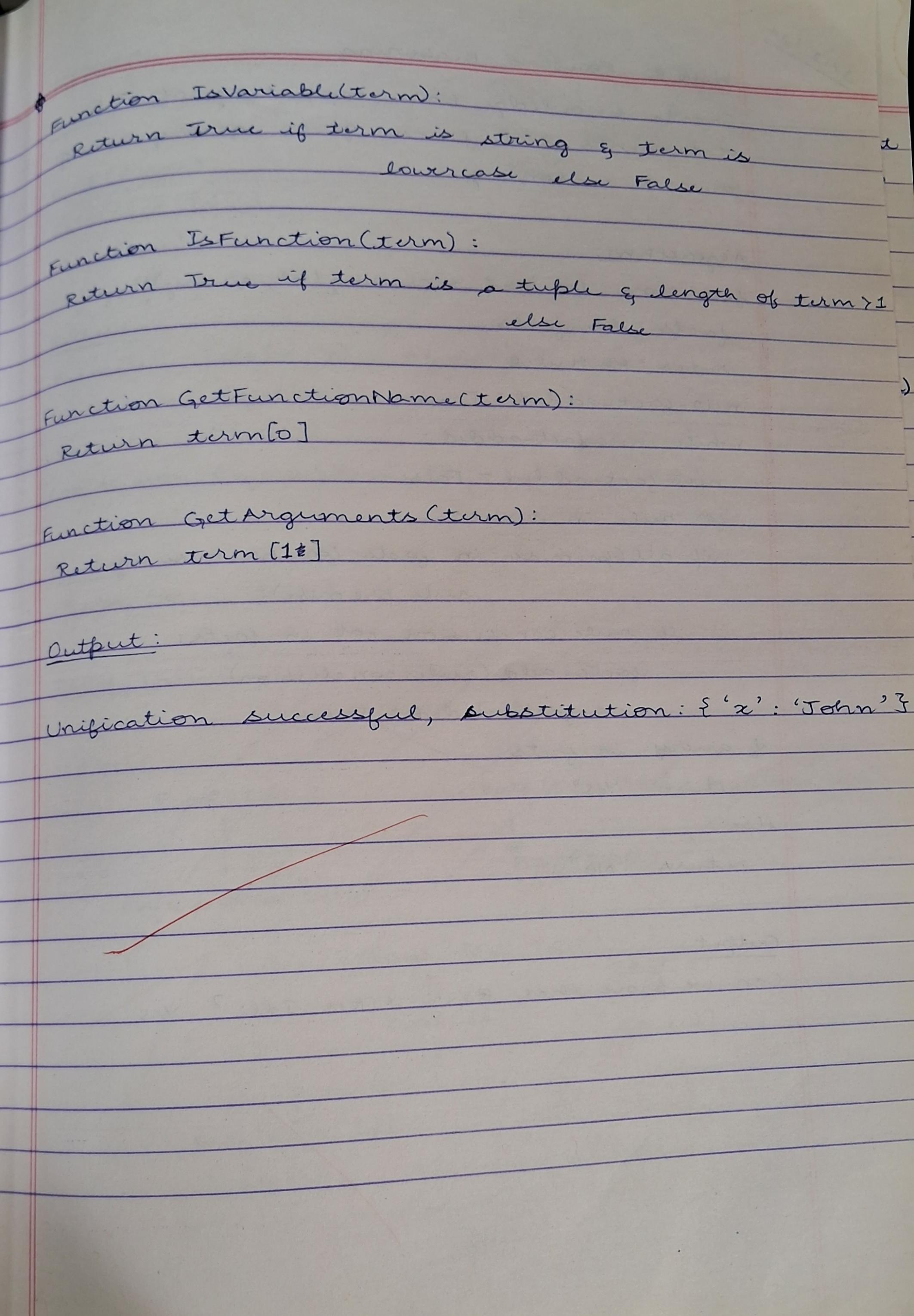
    print("Unification failed")

**Output:**

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**Algorithm:**

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