Code

```
import re
def getAttributes (expression):
    expression = expression. split (."(")[1:]
    expression = "(". join (expression)
    expression = expression [: -1]
    ___________ = re. split ("(?<!\(.),(?!.\))", expression)
    return expression
                                            hears(John, x)    — ①
                                            hears(John, Jane). — ②
def unify(exp1, exp2):
    if exp1 == exp2 : #Checks the entire expression
        return[]

    if isConstant(exp1) and isConstant(exp2):
        if exp1!= exp2:
            return False

    if isConstant(exp1):
        return [(exp1, exp2)]  # returns substitution list.

    if isConstant (exp2):                   Knows(John, x)
        return ([exp2, exp1)].              Knows(Jane, y).

    if isVariable (exp1):
        if checkOccurs (exp1, exp2);
            return False
        else
            return [(exp2, exp1)]

    if isVariable (exp2):
        if checkOccurs (exp2, exp1):
            return False
        else
            return[(exp1, exp2)]

    if getInitialPredicate(exp1)!= getInitialPredicate(exp2):
        print("Predicates don't match!");
        return False
```

```
attributeCount1 = len(getAttributes(exp1))
——"—— 2 = ——"—————————— 2

    if attributeCount1 != attributeCount2:
        return False

    head1 = getFirstPart(exp1)
    head2 = ——"——————(exp2)
    initialSubstitution = unify(head1, head2)
    if not initialSubstitution:
        return False
    if attributeCount1 == 1:
        return initialSubstitution

    tail1 = getRemainingPart(exp1)
    Tail2 = ————"————(exp2)

    if initialSubstitution != []:
        tail1 = apply(tail1, initialSubstitution)
        tail2 = apply(tail2, initialSubstitution)

    remainingSubstitution = unify(tail1, tail2)
    if not remainingSubstitution:
        return False

    initialSubstitution.extend(remainingSubstitution)
    return initialSubstitution


exp1 = "knows(X)"
exp2 = "knows(Richard)"
substitutions = unify(exp1, exp2)
print("Substitutions:")
print(Substitutions)
```

Unification – making 2 expressions look identical.

Output:

```
[('X', 'Richard')]
```

Conditions:

- The predicate should be the same
- The no. of arguments in both the expressions must be the same.
- If 2 similar variables are present in the same exp, Then unification fails.

```
exp1 = "knows(A, x)"
exp2 = "knows(y, mother(y))"
```

Output: Substitutions:

```
[('A', 'y'), ('mother(y)', 'x')]
```

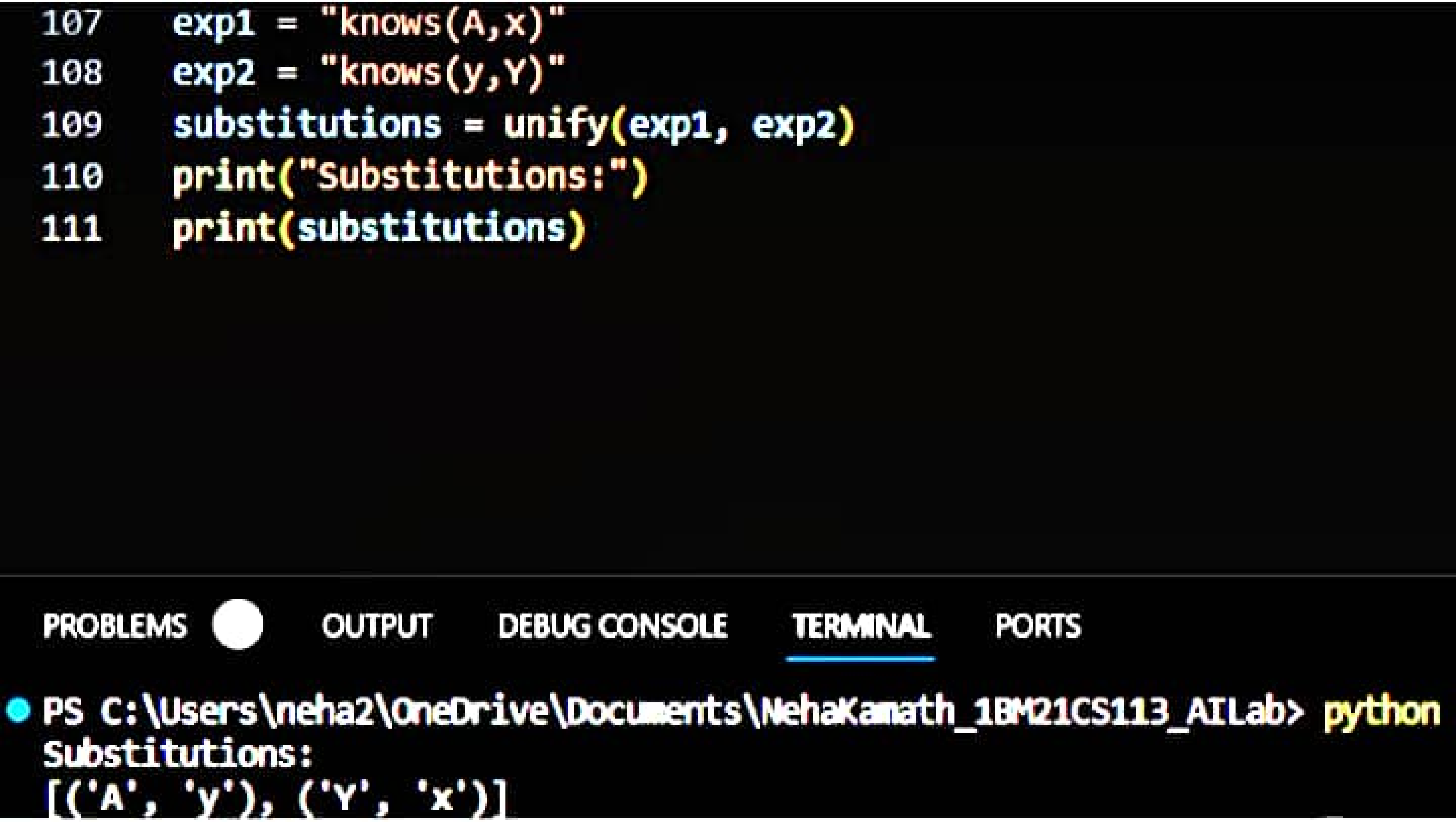
$P(x, F(y))$ — ①

$P(a, F(g(z))$ — ②

$[a|x]$ (x with a)

$P(a, F(y))$, $P(a, F(g(z))$ $[g(z)|y]$

$P(a, F(g(z))$, $P(a, F(g(z))$



```python
exp1 = "knows(A,x)"
exp2 = "knows(y,Y)"
substitutions = unify(exp1, exp2)
print("Substitutions:")
print(substitutions)
```

```
PS C:\Users\neha2\OneDrive\Documents\NehaKamath_1BM21CS113_AILab> python
Substitutions:
[('A', 'y'), ('Y', 'x')]
```

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