AI EX-1: Implementation of Toy Problem

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*Problem Name : Water Jug Problem

*Problem Statement : There are given two jugs, a 4-gallon one and a 3-gallon one, a pump which has unlimited water which you can use to fill the jug, and the container in which water may be poured. Neither jug has any measuring markings on it. How to get exactly 2 gallons of water in the 4-gallon jug?

Note : Initially both the jugs are empty.

*Code:

```
print("Water Jug Problem")
x=int(input("Enter X:"))
y=int(input("Enter Y:"))
while True:
    rno=int(input("Enter the Rule no"))
    if rno==1:
        if x<4:
            x=4
    if rno==2:
```

```python
        if y<3:
            y=3
    if rno==5:
        if x>0:
            x=0
    if rno==6:
        if y>0:
            y=0
    if rno==7:
        if x+y>=4 and y>0:
            x,y=4,y-(4-x)
    if rno==8:
        if x+y>=3 and x>0:
            x,y=x-(3-y),3
    if rno==9:
        if x+y<=4 and y>0:
            x,y=x+y,0
    if rno==10:
        if x+y<=3 and x>0:
            x,y=0,x+y
    print("X=",x)
    print("Y=",y)
    if(x==2):
        print("The Goal is reached")
        break
```

Jupyter   Water-Jug Problem Last Checkpoint: 18 minutes ago (unsaved changes)   Logout

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Code

```python
In [3]:  print("Water Jug Problem")
         x=int(input("Enter X:"))
         y=int(input("Enter Y:"))
         while True:
             rno=int(input("Enter the Rule no"))
             if rno==1:
                 if x<4:
                     x=4
             if rno==2:
                 if y<3:
                     y=3
             if rno==5:
                 if x>0:
                     x=0
             if rno==6:
                 if y>0:
                     y=0
             if rno==7:
                 if x+y>=4 and y>0:
                     x,y=4,y-(4-x)
             if rno==8:
                 if x+y>=3 and x>0:
                     x,y=x-(3-y),3
             if rno==9:
                 if x+y<=4 and y>0:
                     x,y=x+y,0
             if rno==10:
                 if x+y<=3 and x>0:
                     x,y=0,x+y
             print("X=",x)
             print("Y=",y)
             if(x==2):
                 print("The Goal is reached")
                 break
```

```
Water Jug Problem
Enter X:0
Enter Y:0
Enter the Rule no2
X= 0
```
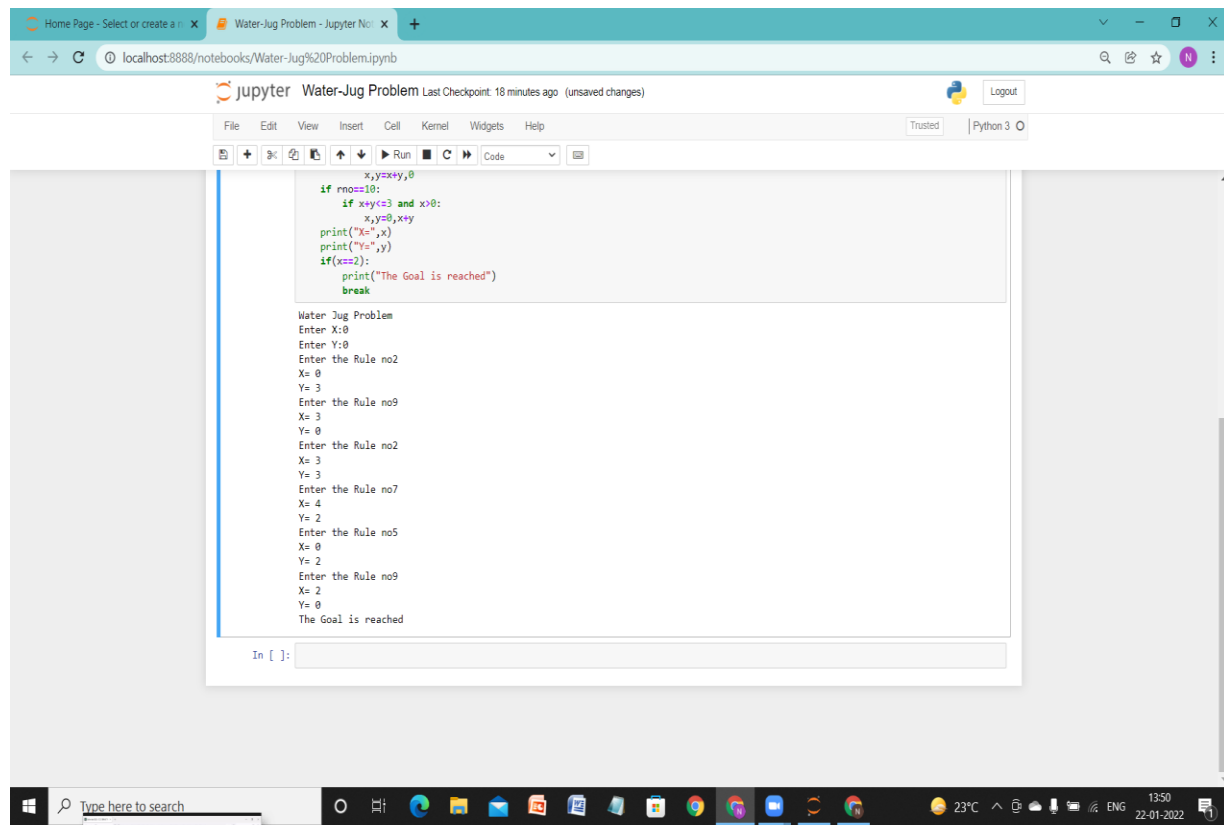
*Output:

*State a scenario to map your toy world solution to a real-world solution.

In solving water jug problem we have used production rule, which is used in our day to day life in the field of artificial intelligence and in the field of production in the companies. It provides modularity, as all the rules can be added, deleted or modified individually.