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class Farmer:
    def __init__(self, position = "left"):
        self.position = position

    def move_Left(self):
        self.position = "left"

    def move_Right(self):
        self.position = "right"

    def showPos(self):
        return self.position

    def showDes(self):
        destination = 0
        if self.position == "right":
            destination = "left"
            return destination
        else:
            destination = "right"
            return destination

class Sheep:
    def __init__(self, status = "alive", position = "left"):
        self.status = status
        self.position = position

    def transport_Left(self):
        self.position = "left"

    def transport_Right(self):
        self.position = "right"

    def isEaten(self):
        self.status = False

    def showPos(self):
        return self.position

    def showStatus(self):
        return self.status

class Wolf:
    def __init__(self, status = "alive", position = "left"):
        self.status = status
        self.position = position

    def transport_Left(self):
        self.position = "left"

    def transport_Right(self):
        self.position = "right"

    def showPos(self):
        return self.position

class Cabbage:
    def __init__(self, status = "alive", position = "left"):
        self.status = status
        self.position = position

    def transport_Left(self):
        self.position = "left"

    def transport_Right(self):
        self.position = "right"

    def showPos(self):
        return self.position

    def showStatus(self):
        return self.status

    def isEaten(self):
        self.status = False
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def problemPrompt():
    print('A farmer has to transport the sheep, cabbage, and wolf across the river.')
    print('But the farmer is only allowed to transport one passenger at a time.')
    print('If left unattended together, the wolf would eat the sheep, or the sheep would eat the cabbage.\n')
    print('How will the farmer be able to transport the 3 safely across the river?')

def transporter(passenger, farmerPos):

    #sheep
    if passenger == 'a':
        if farmerPos == "left" and Sheep1.showPos() == "left":
            Sheep1.transport_Right()
            Farmer1.move_Right()
            print("The sheep is safely transferred across the river (right side).")

        elif farmerPos == "left" and Sheep1.showPos() == "right":
            print("The sheep is already across the river! (right side)")

        elif farmerPos == "right" and Sheep1.showPos() == "right":
            Sheep1.transport_Left()
            Farmer1.move_Left()
            print("The sheep is safely transferred back (left side).")

        elif farmerPos == "right" and Sheep1.showPos() == "left":
            print("The sheep is already on the left side!")

    #wolf
    elif passenger == 'b':
        if farmerPos == "left" and Wolf1.showPos() == "left":
            Wolf1.transport_Right()
            Farmer1.move_Right()
            print("The wolf is safely transferred across the river (right side).")

        elif farmerPos == "left" and Wolf1.showPos() == "right":
            print("The wolf is already across the river! (right side)")

        elif farmerPos == "right" and Wolf1.showPos() == "right":
            Wolf1.transport_Left()
            Farmer1.move_Left()
            print("The wolf is safely transferred back. (left side)")

        elif farmerPos == "right" and Wolf1.showPos() == "left":
            print("The wolf is already on the left side!")

    #cabbage
    elif passenger == 'c':
        if farmerPos == "left" and Cabbage1.showPos() == "left":
            Cabbage1.transport_Right()
            Farmer1.move_Right()
            print("The cabbage is safely transferred across the river.")

        elif farmerPos == "left" and Cabbage1.showPos() == "right":
            print("The cabbage is already across the river!")

        elif farmerPos == "right" and Cabbage1.showPos() == "right":
            Cabbage1.transport_Left()
            Farmer1.move_Left()
            print("The cabbage is safely transferred back. (left side)")

        elif farmerPos == "right" and Cabbage1.showPos() == "left":
            print("The cabbage is already on the left side!")

    #None
    elif passenger == 'd':
        if farmerPos == "left":
            Farmer1.move_Right()
            print("The farmer traveled alone across the river.")

        elif farmerPos == "right":
            Farmer1.move_Left()
            print("The farmer traveled alone back")

def posBar():
    print("\n    POSITIONS    ")
    print(f"Sheep   : {Sheep1.showPos()} (side)")
    print(f"Wolf    : {Wolf1.showPos()} (side)")
    print(f"Cabbage  : {Cabbage1.showPos()} (side)")

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print(T Cabbage: {Cabbage1.showPos() } (Side) )

def check_safety():
    global flag
    if Wolf1.showPos() == Sheep1.showPos() and Farmer1.showPos() != Wolf1.showPos():
        Sheep1.isEaten()
        print("You Failed! The Wolf ate the sheep!")
        flag = False
    elif Sheep1.showPos() == Cabbage1.showPos() and Farmer1.showPos() != Sheep1.showPos():
        Cabbage1.isEaten()
        print("You Failed! The Sheep ate the cabbage!")
        flag = False

def winCon():
    global flag
    if Wolf1.showPos() == "right" and Sheep1.showPos() == "right" and Cabbage1.showPos() == "right":
        print("Congratulations! all passengers are now across the river.")
        flag = False
    else:
        pass

def input_Checker(choice):
    if choice != 'a' and choice != 'b' and choice != "c" and choice != "d":
        print("Invalid input! please try again.")
    else:
        transporter(choice, Farmer1.showPos())

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Wolf1 = Wolf()
Cabbage1 = Cabbage()
Sheep1 = Sheep()
Farmer1 = Farmer()

flag = True
problemPrompt()
while flag:
    posBar()
    print("\n")
    print(f' Choose a passenger to bring across the {Farmer1.showDes()} side of the river: ')
    choice = input('[a] Sheep\n[b] Wolf\n[c] Cabbage\n[d] None\n')
    input_Checker(choice)
    check_safety()
    winCon()

```

A farmer has to transport the sheep, cabbage, and wolf across the river.  
 But the farmer is only allowed to transport one passenger at a time.  
 If left unattended together, the wolf would eat the sheep, or the sheep would eat the cabbage.

How will the farmer be able to transport the 3 safely across the river?

POSITIONS

Sheep : left (side)  
 Wolf : left (side)  
 Cabbage: left (side)

Choose a passenger to bring across the right side of the river:

[a] Sheep  
 [b] Wolf  
 [c] Cabbage  
 [d] None

a

The sheep is safely transferred across the river (right side).

POSITIONS

Sheep : right (side)  
 Wolf : left (side)  
 Cabbage: left (side)

Choose a passenger to bring across the left side of the river:

[a] Sheep  
 [b] Wolf  
 [c] Cabbage  
 [d] None

d

The farmer traveled alone back

## POSITIONS

Sheep : right (side)  
Wolf : left (side)  
Cabbage: left (side)

Choose a passenger to bring across the right side of the river:

- [a] Sheep
  - [b] Wolf
  - [c] Cabbage
  - [d] None
- c

The cabbage is safely transferred across the river.

## POSITIONS

Sheep : right (side)  
Wolf : left (side)  
Cabbage: right (side)

Choose a passenger to bring across the left side of the river:

- [a] Sheep
- [b] Wolf
- [c] Cabbage