

detchosa-malaki-assignment-1-2

January 27, 2024

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[1]: class Jack:
    def __init__(self, name):
        self.name = name
        self.passenger = None

    def carry(self, boat, passenger):
        if self.passenger is None:
            self.passenger = passenger
            print(f"{self.name} is now carrying {passenger.name} on the boat.
↪\n")
            boat.carryB([passenger, self])

    def drop(self, boat):
        if self.passenger is not None:
            boat.dropB()
            self.passenger = None
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[2]: class Boat:
    def __init__(self, name, location):
        self.passengers = None
        self.name = name
        self.location = location

    def cross(self):
        if self.location == "A":
            destination = "B"
        else:
            destination = "A"

        print(f"The boat is crossing from location {self.location} to location_
↪{destination} with passengers:")
        for passenger in self.passengers:
            print(f"- {passenger.name}")

        self.location = destination

    def carryB(self, passengers):
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        self.passengers = passengers
        for passenger in self.passengers:
            passenger.location = self.location

    def dropB(self):
        print(f"\n{self.name} has reached the location {self.location}.\n")
        for passenger in self.passengers:
            passenger.location = self.location
        self.passengers = []

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[3]: class Wolf:
        def __init__(self, name):
            self.name = name

class Sheep:
    def __init__(self, name):
        self.name = name

class Cabbage:
    def __init__(self, name):
        self.name = name

class No_passenger:
    def __init__(self, name):
        self.name = name

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[15]: def checker(jack, wolf, sheep, cabbage):
        if wolf.location == "B" and sheep.location == "B" and cabbage.location != "B":
            print("Wolf eats sheep. You lose.")

        elif sheep.location == "B" and cabbage.location == "B" and wolf.location != "B":
            print("Sheep eats cabbage. You lose.")

        elif wolf.location == "B" and sheep.location == "B" and cabbage.location == "B":
            print("You successfully cross the river with Jack, Wolf, Sheep and Cabbage!")

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[16]: # Assign variables
jack = Jack("Jack")
wolf = Wolf("Wolf")
sheep = Sheep("Sheep")

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cabbage = Cabbage("Cabbage")
NA = No_passenger("no passenger")
boat = Boat("Boat", "A")

# Jack with the sheep
jack.carry(boat, sheep)
boat.cross()
jack.drop(boat)

# Jack returns
jack.carry(boat, NA)
boat.cross()
jack.drop(boat)

# Jack with wolf
jack.carry(boat, wolf)
boat.cross()
jack.drop(boat)

# Jack returns with sheep
jack.carry(boat, sheep)
boat.cross()
jack.drop(boat)

# Jack with cabbage
jack.carry(boat, cabbage)
boat.cross()
jack.drop(boat)

# Jack returns
jack.carry(boat, NA)
boat.cross()
jack.drop(boat)

# Jack with sheep
jack.carry(boat, sheep)
boat.cross()
jack.drop(boat)

# To verify the constraints
checker(jack, wolf, sheep, cabbage)

```

Jack is now carrying Sheep on the boat.

The boat is crossing from location A to location B with passengers:

- Sheep
- Jack

Boat has reached the location B.

Jack is now carrying no passenger on the boat.

The boat is crossing from location B to location A with passengers:

- no passenger
- Jack

Boat has reached the location A.

Jack is now carrying Wolf on the boat.

The boat is crossing from location A to location B with passengers:

- Wolf
- Jack

Boat has reached the location B.

Jack is now carrying Sheep on the boat.

The boat is crossing from location B to location A with passengers:

- Sheep
- Jack

Boat has reached the location A.

Jack is now carrying Cabbage on the boat.

The boat is crossing from location A to location B with passengers:

- Cabbage
- Jack

Boat has reached the location B.

Jack is now carrying no passenger on the boat.

The boat is crossing from location B to location A with passengers:

- no passenger
- Jack

Boat has reached the location A.

Jack is now carrying Sheep on the boat.

The boat is crossing from location A to location B with passengers:

- Sheep
- Jack

Boat has reached the location B.

You successfully cross the river with Jack, Wolf, Sheep and Cabbage!