Farm Class Test Strategy

Constructor Tests

Create a Farm object with the default constructor:

- Verify name is null
- Verify state is initialized with empty predator list
- Verify sheep array is null

Create a Farm object with the non-default constructor:

with valid field values:

- Valid farm name (non-null, non-empty string)
- Valid state object with predator list
- Valid number of sheep (positive integer)
- Valid number of lambs (positive integer)
- Verify sheep array is properly initialized with correct total size
- Verify correct number of sheep vs lambs in array

with invalid field values:

- Null farm name
- Null state object
- Negative number of sheep
- Negative number of lambs
- Zero total animals (both sheep and lambs are 0)

Test all get methods:

Test getAlpacaHiringCost():

- Verify returns correct constant value (500)

Test getAlpacaMaintenanceCost():

- Verify returns value within expected range (400-600)
- Test randomness by creating multiple Farm objects

Test GetFarmName():

- Verify returns correct farm name
- Test with null name
- Test with empty string name

Test GetFarmState():

- Verify returns correct state object
- Test with null state
- Test state contains correct predator list

Test getName():

- Verify returns same value as GetFarmName()

Test getSheep():

- Verify returns correct sheep array
- Test array length matches constructor parameters
- Verify sheep types (lambs vs adult sheep) are correct

Test getState():

- Verify returns same value as GetFarmState()

Test getValuePerSheep():

- Verify returns correct constant value (150)

Test getValuePerLamb():

- Verify returns correct constant value (250)

Test getValuePerAlpaca():

- Verify returns correct constant value (1000)

Test all set methods:

Test SetFarmName():

with valid field values:

- Non-null string
- Empty string
- Very long string
- String with special characters

with invalid field values:

- Null string

Test SetFarmState():

with valid field values:

- Valid state object with predators
- Valid state object with empty predator list
- State with different names

with invalid field values:

- Null state object

Test setName():

with valid field values:

- Non-null string
- Empty string
- Very long string

with invalid field values:

- Null string

Test setSheep():

with valid field values:

- Valid sheep array with mixed sheep and lambs
- Empty sheep array
- Array with only sheep
- Array with only lambs

with invalid field values:

- Null sheep array

Test setState():

with valid field values:

- Valid state object
- State with different predator configurations

with invalid field values:

- Null state object

Test Simulation method:

Test Simulation() with different alpaca counts:

- Test with 0 alpacas
- Test with 1 alpaca
- Test with 2 alpacas
- Test with negative alpaca count
- Test with very large alpaca count

Verify simulation results:

- SimulationResult object is not null
- Total cost calculation is correct
- Animal loss counts are within valid ranges
- Alpaca loss count doesn't exceed input count
- Predator-specific loss tracking is accurate

Test toString() method:

- Verify string representation includes all relevant fields
- Test with null values
- Test with various field combinations