Lab 8: The Cow Strikes Back

Overview

This lab's purpose is to provide students with experience in inheritance of classes and working with multiple classes. It is recommended that students use command line tools and editors for this lab (though it is not strictly speaking required). This lab will require students to build on their previous lab experience, in which a version of the cowsay utility was created.

Specification

Students will update the driver program file (`cowsay.py`) and also create two new classes - `Dragon` and `IceDragon`. The `Dragon` class should extend the `Cow` class, and `IceDragon` must be derived from `Dragon`. As before, `heifer_generator.py` is provided for you – but updated to handle the new Dragon class and its subtypes. (Please refer to specification for previous lab for a refresher.) Students may implement private attributes and methods if they choose to do so. This is not required – it is purely optional. **No public attributes / methods should be added to the specification!**

cowsay.py (Program Driver)

Your program must accept command line arguments as follows:

```
python3 cowsay.py -l Lists the available cows
python3 cowsay.py MESSAGE          Prints out the MESSAGE using the default COW
python3 cowsay.py -n COW MESSAGE Prints out the MESSAGE using the specified COW
```

In addition, this version of the utility handles a special set of `Cow`-derived `Dragon` class (and its subclasses). Whenever a dragon-type cow is selected, the display of the message **must be followed by a line stating whether or not the dragon is fire-breathing**:

Lab 8: The Cow Strikes Back

Cow Class

The **Cow** class must have all of the same methods as previously required (though students may add private methods). The methods are repeated here, briefly, for reference.

```
__init__(self, name) // Constructor
get_name(self) // Returns name of this cow object
get_image(self) // Return image for this cow object
set_image(self, image) // Sets the image for this cow object to image
```

Dragon Class

The **Dragon** class must be derived from the **Cow** class and must make all of its methods available. In addition, Dragon must provide the following methods:

__init__(self, name, image)
Constructor; creates a new **Dragon** object with the given **name** and **image**.
can_breathe_fire()
This method should exist in **every** **Dragon** class. For the default **Dragon** type, it should always return T**rue**.

IceDragon Class

The **IceDragon** class must be derived from the **Dragon** class and must make all of its methods available:

__init__(self, name, image)
Constructor; creates a new **IceDragon** object with the given **name** and **image**.
can_breathe_fire()
For the **IceDragon** type, this method should always return F**alse**.

Lab 8: The Cow Strikes Back

Submissions

NOTE: Your output must match the example output *exactly*.

Files: cowsay.py, cow.py, dragon.py, ice_dragon.py
Method: Submit on Canvas

Lab 8: The Cow Strikes Back

Sample Output

```
>python3 cowsay.py Hello World!

Hello World!
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>python3 cowsay.py -n kitteh Moew-Moew!

Moew-Moew!
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>python3 cowsay.py -l
Cows available: heifer kitteh dragon ice-dragon

>python3 cowsay.py -n ninja Hello world!
Could not find ninja cow!

>python3 cowsay.py -n dragon Firey RAWR

Fiery RAWR
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This dragon can breathe fire.
```

Lab 8: The Cow Strikes Back

```
>python3 cowsay.py -n ice-dragon Ice-cold RAWR

Ice-cold RAWR
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              ///-._ _ _ _ _ _}^ - - - - ~                     `-----'
```

This dragon cannot breathe fire.