

100pts

Name 1: _____

Name 2: _____

Class Day / Time: _____

Due Date: _____

Lab #16: Polymorphism

Create a class to track Farmer Pete's livestock, which are sheep & pigs. Using polymorphism, keep all animals in a single doubly-linked list.

For each animal the class should be able to track the

- Name & age
- Create methods to retrieve any of the attributes listed.
- Overload the constructor such that all attributes can be initialized when an object is instantiated.
- Define the destructor, display, displayTable, and speak methods of the base class to be virtual.
- Display should Display an individual animal.
- Display Table should be able to display in table format (see sample output)
- Speak should allow the animal to speak in its own voice (return a string with the animal's sound).

Derive classes from the animal class: Sheep & Pig.

- The sheep class should be extended to handle a wool type and wool color.
- The pig class should be extended to account for a TailType.
- Override all of the display methods in both classes to include the extended attributes.
- Override the speak methods in both classes to speak the language of the animal specified (sheep baa, pigs oink)
- Use enumerated types for the main menu, the WoolType, and TailType.

Wool Types: LONG, MEDIUM, FINE, CARPET

Tail Types: STRAIGHT, CORKSCREW, CURL_UP, CURL_RIGHT, CURL_LEFT

Using Polymorphism, all animals should be stored in a single list using references to the base class. This class should also provide methods to:

- Add an animal (Pig or Sheep) to the list (in alphabetical order)
- Remove an animal by name
- Display the first animal
- Find and Display an animal
- Return the list size
- Display the list of animals in a table format
- Clear the list

Provide the following menu and associated functionality.

```

*****
* WELCOME TO THE ANIMAL LIST MANAGER *
*****
1 - Add Animal
2 - Remove Animal
3 - Output 1st Animal
4 - Find Animal
5 - List Size
6 - Display Table
7 - Clear List
0 - Exit
Enter a command: 1

```

The Display Table option for the Farmlist should Output a table formatted as follows:

ANIMAL	NAME	AGE	WOOL/TAIL TYPE	FOLLOWED BY
Pig	Babe	2	Straight	Maa
Sheep	Maa	9	Long (Black)	Nobody

There are 2 animals on the Farm!

All input values should be error checked (use generic functions).

Sheep Max Age = 9

Pigs Max Age = 20

Test your code thoroughly.

Turn in (IN THIS ORDER - stapled)

1. The **first page** of this lab
2. **Output** → cut and pasted to a txt file within eclipse and printed
3. **Header Files** (General header file then class header file)
4. Main
5. Implementation of Class Methods
6. Implementation of any necessary functions

