Assignment 07A – Pets: Dogs and Cats (Inheritance)

ALIGNMENT: This assignment introduces the concept of **inheritance** in Object-Oriented Programming. This involves creating a parent class (aka superclass) from which children classes (sub classes) may inherit the parent's attributes and methods.

ASSIGNMENT: Create a Python parent class named Pet and two sub classes, Dogs and Cats that inherit from the parent class. These classes will be used to add Dog or Cat instances to a global list (I named it "kennel"), display the content of the list for all pets, all dogs, and all cats; show the details for any one pet, search for a particular breed, and remove (adopt out) an animal. Initially, a number of cats and dogs are populated into the kennel list from a text file provided in Canvas assignments ("kennel.txt").Any changes (adding or removing) will automatically save the data out to the original data text file. The menu options remain in play, until the user chooses to exit the program (by entering X).

```
MENU:
  A - Add dog(s)
  B - Add cat(s)
  C - List all pets
  D - List all DOGS
  E - List all CATS
  F - Get details
  G - Search for a breed
  H - Adopt a pet out
  ? - Show the menu
  X - Exit the program

Enter your menu choice (? to display menu):
```

The **Add Dog(s)** choice (A) utilizes a while loo to add dog records until the user enters a blank name for a new dog.. After gathering the data for each new dog, the program calls the Dog class initializer to create a new instance for that dog in the kennel list. Once the new entries have ceased, the kennel list is sorted and its contents automatically saved out to the kennel.txt data file.

```
Enter your menu choice (? to display menu): A

Add a DOG to the kennel...
Enter the name of the new dog (leave blank to end): Hunter
Enter the gender of the new dog (M or F): M
Enter the breed of the dog: Catahula
Enter the birthdate of the dog (MM/DD/YYYY): 09/30/2015
Is the dog housebroken? (Y,N or U): y
Does the dog know basic obedience commands? (Y,N or U): y
Does the dog get along with other dogs? (Y,N or U): y
Does the dog get along with cats? (Y,N or U): u

Add a DOG to the kennel...
Enter the name of the new dog (leave blank to end):
Data file auto updated.

Enter your menu choice (? to display menu):
```

Choice B, **Add cat(s),** operates in the same manner as choice A , but asks questions pertinent to cats (e.g. litterbox trained) and creates instances of the Cat class in the kennel list.

```
Enter your menu choice (? to display menu): b

Add a CAT to the kennel...
Enter the name of the new cat (leave blank to end): Fluffy
Enter the gender of the new cat (M or F): F
Enter the breed of the cat: Snowshoe
Enter the birthdate of the cat (MM/DD/YYYY): 07/12/202
Enter the birthdate of the cat (MM/DD/YYYY): 07/12/2012
Is the cat litterbox trained? (Y,N or U): y
Does the cat get along with dogs? (Y,N or U): n
Does the cat get along with other cats? (Y,N or U): n

Add a CAT to the kennel...
Enter the name of the new cat (leave blank to end):
Data file auto updated.

Enter your menu choice (? to display menu):
```

The **List All Pets** option (choice C) prints a listing of all pets (stored in alphabetical order):

```
Enter your menu choice (? to display menu): c

LISTING OF ALL PETS
TYPE ID#       NAME                GENDER  BREED                   BIRTHDATE
==== =======   ==========          ======  ==========              ==========
DOG  BGQ0085   Abby                Female  Doberman Pinscher       01/30/2014
DOG  RRW8553   Angel               Female  Chow Chow               04/14/2013
DOG  WZF3275   Argus               Male    Chihuahua               01/01/2008
DOG  WTY3935   Brutus              Male    Boxer                   01/01/2016
DOG  JIB3557   Buddy               Male    Labrador (Chocolate)    08/02/2017
DOG  XMG6687   Chrissy             Female  Rottweiler              11/16/2001
CAT  HFO3135   Clem                Male    Siamese                 10/29/2012
DOG  VLO0030   Cooper              Male    Golden Retriever        01/01/2016
```

Choices D and E list only the dogs and cats. TIP: Here you can use the **isinstance( )** method of the such as:

```
if isinstance(listItem, pet.Dog):
        print(listItem)
```

```
Enter your menu choice (? to display menu): d

LISTING OF ALL DOGS
TYPE ID#       NAME                GENDER  BREED                   BIRTHDATE
==== =======   ==========          ======  ==========              ==========
DOG  BGQ0085   Abby                Female  Doberman Pinscher       01/30/2014
DOG  RRW8553   Angel               Female  Chow Chow               04/14/2013
DOG  WZF3275   Argus               Male    Chihuahua               01/01/2008
DOG  WTY3935   Brutus              Male    Boxer                   01/01/2016
DOG  JIB3557   Buddy               Male    Labrador (Chocolate)    08/02/2017
DOG  XMG6687   Chrissy             Female  Rottweiler              11/16/2001
DOG  VLO0030   Cooper              Male    Golden Retriever        01/01/2016
DOG  CSB5813   Dexter              Male    Golden Retriever        05/01/2014
DOG  HTZ9961   Duke                Male    Labrador (yellow)       06/21/2008
```

```
Enter your menu choice (? to display menu): e

LISTING OF ALL CATS
TYPE ID#       NAME                GENDER  BREED                   BIRTHDATE
==== =======   ==========          ======  ==========              ==========
CAT  HFO3135   Clem                Male    Siamese                 10/29/2012
CAT  EZI1968   Fluffy              Female  Snowshoe                07/12/2012
CAT  NFR587    Jasper              Male    Russian Blue            10/15/2014
CAT  FJP9396   Keisha              Female  American Shorthair      03/16/2010
CAT  ZKW5889   Miss Kitty          Female  American Longhair       09/09/2011
CAT  UBK0320   Raisa               Female  American Shorthair      03/16/2010
CAT  ZTP6351   Sasha               Female  American Shorthair      03/16/2010
CAT  TED5051   Sterling            Male    American Shorthair      09/01/2014
CAT  RGJ1726   Zebo                Male    Snowshoe                05/05/2011
```

Choice F (Get Details) will show the details for any animal based on its ID number:

```
Enter your menu choice (? to display menu): f
Enter ID number of animal: tvy1130

TYPE  ID#       NAME                GENDER  BREED                   BIRTHDATE
==== =======   ==========          ======  ==========              ==========
DOG  TVY1130   Serenity Grace      Female  Rottweiler              03/09/2015
    Housebroken?:     Yes
    Basic Obedience?: Yes
    Good with dogs?:  Yes
    Good with cats?:  Yes
```

Choice G (**Search for Breed**) allows the user to search for a particular breed (partial names are acceptable):

```
Enter your menu choice (? to display menu): g
Enter breed to search for: lab

LISTING OF LABs
DOG  JIB3557   Buddy              Male    Labrador (Chocolate)     08/02/2017
DOG  HTZ9961   Duke               Male    Labrador (yellow)        06/21/2008
DOG  VDB3971   Otis               Male    Labradoodle              05/17/2014
DOG  LMQ2060   Rusty              Male    Labradoodle              06/12/2014
4 LABs found

Enter your menu choice (? to display menu):
```

Of course we may need to remove an animal – hopefully it got adopted out, so choice H allows up to Adopt Out an animal and remove it from the kennel list. And just as adding cats and dogs caused our kennel.txt xaved data file to be re-written, so does the Adopt Out method. It's important to keep your saved data up to date!

```
Enter your menu choice (? to display menu): H
Enter ID number of animal: ANN0191
ANN0191 [Saphyra] has been adopted!
Data file auto updated.

Enter your menu choice (? to display menu):
```

A choice of ?, causes the menu to be redisplayed. And a choice of X exits the program:

```
Enter your menu choice (? to display menu): ?

MENU:
  A - Add dog(s)
  B - Add cat(s)
  C - List all pets
  D - List all DOGS
  E - List all CATS
  F - Get details
  G - Search for a breed
  H - Adopt a pet out
  ? - Show the menu
  X - Exit the program

Enter your menu choice (? to display menu):
```

And finally, a choice of X, terminates the program:

```
Enter your menu choice (? to display menu): X
Program exited...Goodbye.
```

REQUIREMENTS AND TIPS:

- Create the Pet Class and the two sub classes for Dog and Cat in an external file named pet.py. Save the program file as "**CIS156_07A_Pets_*YourLastName*.py**". They will need to be in teh
- There is a lot to this (relatively simple) program! **Therefore I have made my code available as a graphical PDF in our Canvas site.** You will need to enter all the code and debug any errors you encounter. As you are doing so, contemplate on what each statement is accomplishing.

- Create your superclass for Pet and your sub classes for Dog and Cat based on the UML diagrams below:

Pet	**Dog(Pet)**	**Cat(Pet)**
__name __gender __breed __birthdate __id	__houseBroken -- *Yes, No or Unknown* __basicObedience – Y,N, OR U __dogs *(good with other dogs?) Y, N, or U* __cat (good with cats?) Y, N, U	__litterBox-- *Yes, No or Unknown* __dogs *(good with dogs?) Y, N, or U* __cat (good with other cats?) Y, N, U
• __init__(self,n, g,br,bd,id=None) • createRandomID(self) *randomly generates a new ID - ABC1234* • Accessors for all attributes • Mutators for all except __id • __lt__(self, other) – *sorts alphabetically by name*	• __init__(self,n, g,br,bd,id=None) • Accessors for all attributes • Mutators for all except __id • __str__(self) – *print Pet info with "DOG"* • showDogDetails(self) – *display thre __str__ info along with the four Dog class attributes* • saveTextRecord(self) – *provide all attributes as tab-delimited for*	---------- • __init__(self,n, g,br,bd,id=None) • Accessors for all attributes • Mutators for all except __id • __str__(self) – *print Pet info with "CAT"* • showDogDetails(self) – *display thre __str__ info along with the three Cat class attributes* • saveTextRecord(self) – *provide all attributes as tab-delimited for writing data to datafile*

SUBMIT: Upload the zip file to Canvas in the Assignment 07A area for grading.

GRADING (6 Points)

- 1 point for **cSLO1** – Write Python programs that process user input and display formatted output.
- 1 point for **cSLO2** – Use a `while` loop with a nested structure to handle deleting a record.
- 1 point for **cSLO3** – Utilize functions and a global variable in the project.
- 1 point for **cSLO4** – Use a list to contain the instances of the Superhero objects.
- 1 point for **cSLO4** – Create and use a custom superclass Pet.
- 1 point for **cSLO4** – Create and use subclasses for Dog and Cat that inherit from the Pet class