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**Set 1**

a. Genus is the Parent of Species, Parent-child relationship

b. No relation between Species and Specimen objects

Graphical user interface, text, application

Description automatically generatedc.

d. Two Ways

- Re-use of code, the child class can use the code that is already initialized in the parent class. We don’t need to write the same code again.

- The code is easier to read because it is more structured and compact.

e. Code

I. Because the toString(s) are unique for each class. So each toString has their own unique functions and what not. This is why it does not cause an error.  
II. The term of the property is to override

**Set 2**

a. “Bundling of data with the methods that operate on that data. Encapsulation is used to hide the values or state of a structured data object inside a class, preventing unauthorized parties’ direct access to them. Publicly accessible methods are generally provided in the class (so-called getters and setters) to access the values, and other client classes call these methods to retrieve and modify the values within the object.” (Dave Braunschweig)

b. Two Benefits  
- Protects unwanted access to objects from clients

- Improve code re-usability and easiness to understand.

c. getName(), getCage(), getTOA()

d. name, cageNumber, toa

e. Done

f. Advantage: The code will be more structured because specimen is a subspecies.

Disadvantage: The specimen class would be dependent on the parent class. This here could lead to a less flexible code when it’s going to be modified and what not.

**Set 3**  
a. Add Instance Variable in the Specimen class and label ir “marking”. Add parameter for the marking in the constructor inside Specimen Class. Add getter and setter for marking.

b. Done

c. listSpecies (Specimen[] animals){

LinkedList<String> speciesList = new LinkedList <String>();

for (each animal in animals){

if (animal's species has not existed in speciesList){

insert animal's species into species"ist

}

return allSpecies;

}

**Set 4**

a. Perform number of operations on ADT(Abstract Data Types) without knowing the operation process

b. Done

c. Done

d. Done