



Pusat Pengajian
Pengkomputeran

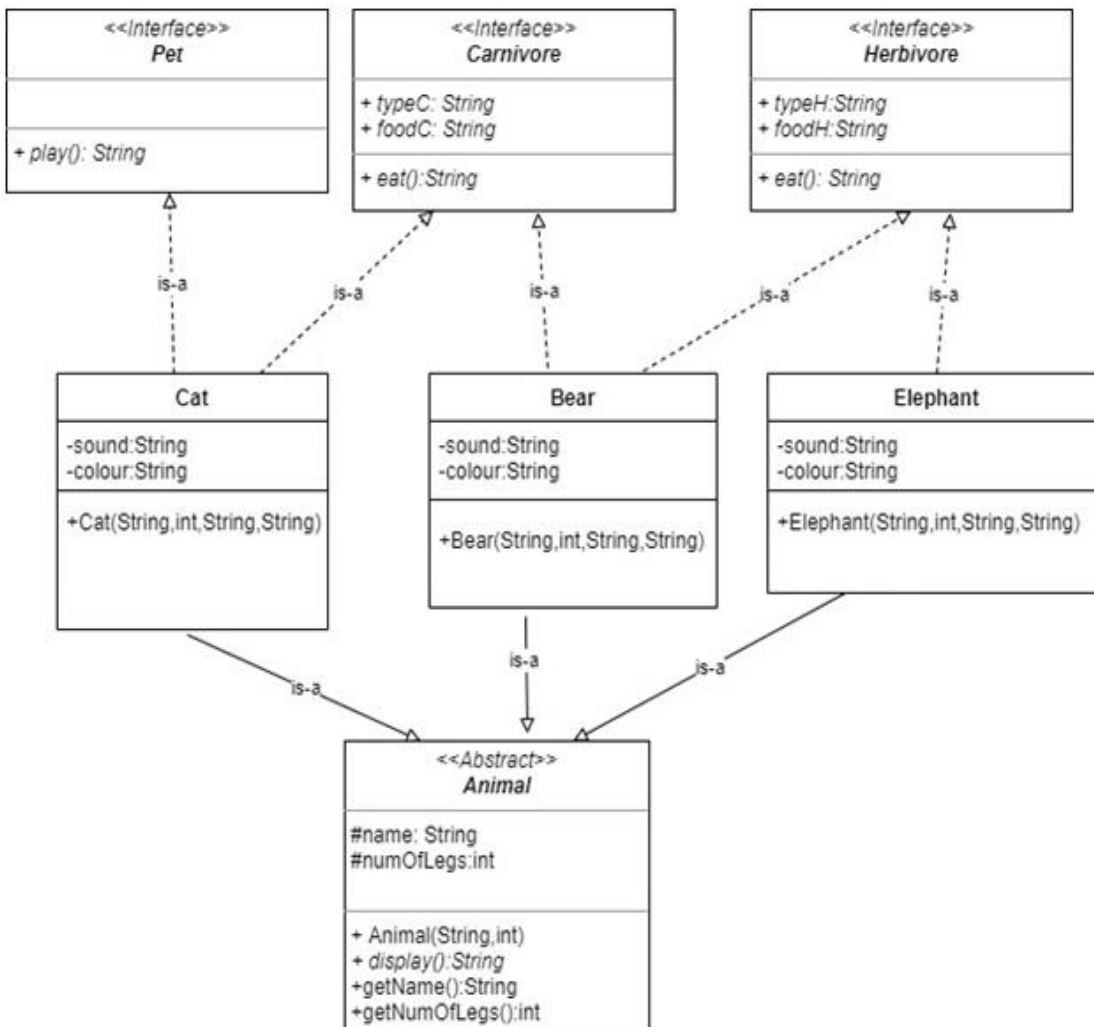
SCHOOL OF COMPUTING

Universiti Utara Malaysia

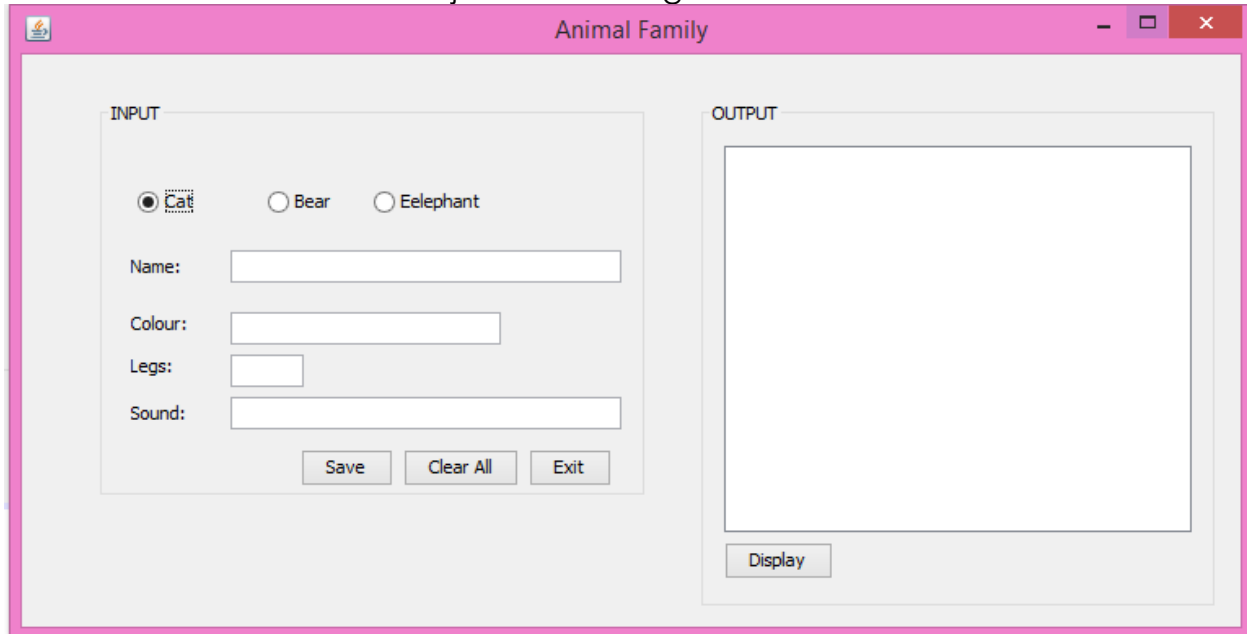
STIA1123 PROGRAMMING 2 INDIVIDUAL ASSIGNMENT 2

Topics: Inheritance, Polymorphism and GUI

Figure below shows a UML class diagram of the animal classes. It is a hierarchy of animals that is rooted in an abstract class *Animal*. Several of the animal classes implement interfaces called *Herbivore*, *Carnivore*, and *Pet*. However, *Cat*, *Bear* and *Elephant* classes given below are incomplete.



1. Write the definition for all classes and the interfaces.
[Hint: Cat, Bear and Elephant classes need to implement all the abstract methods.]
2. Create the AnimalGUI.java and design similar GUI.



- a) Button "Save": to add selected animal object to an array type Animal.
- b) Button "Clear All": to clear all text fields and text area.
- c) Button "Display": to display details of all objects in the array.
- d) Button "Exit": to stop the program.

- Your program must use a for loop to display the output. Invoke the correct methods to get the similar output as given below. [Hint: **MUST** use instanceof and casting]

The screenshot shows the 'Animal Family' application window. In the 'INPUT' section, the 'Bear' radio button is selected. The input fields are: Name: 'Grizzly', Colour: 'Black', Legs: '4', and Sound: 'Growl. Growl. Growl'. The 'OUTPUT' section displays the following text:

```

-----CAT-----
Name :Pussy
Number of Legs:4
Sound :Meow. Meow. Meow.
Color :White
Pussy is a Carnivore and Meat Eaters/Animal Sources.
Cat likes to eat birds,mice,fish etc.
Pussy likes to play with string.
-----BEAR-----
Name :Grizzly
Number of Legs:4
Sound :Growl. Growl. Growl
Color :Black
Bear is an Omnivore.
Omnivore is similar to both Herbivore and Carnivore.
Bear eats both Plants and also Meat Eaters/Animal Sources.
Bear likes to eat berries, roots, fungi, grasses, fish,
carriion, small mammals, and insects.
    
```

A 'Display' button is located at the bottom of the output area.

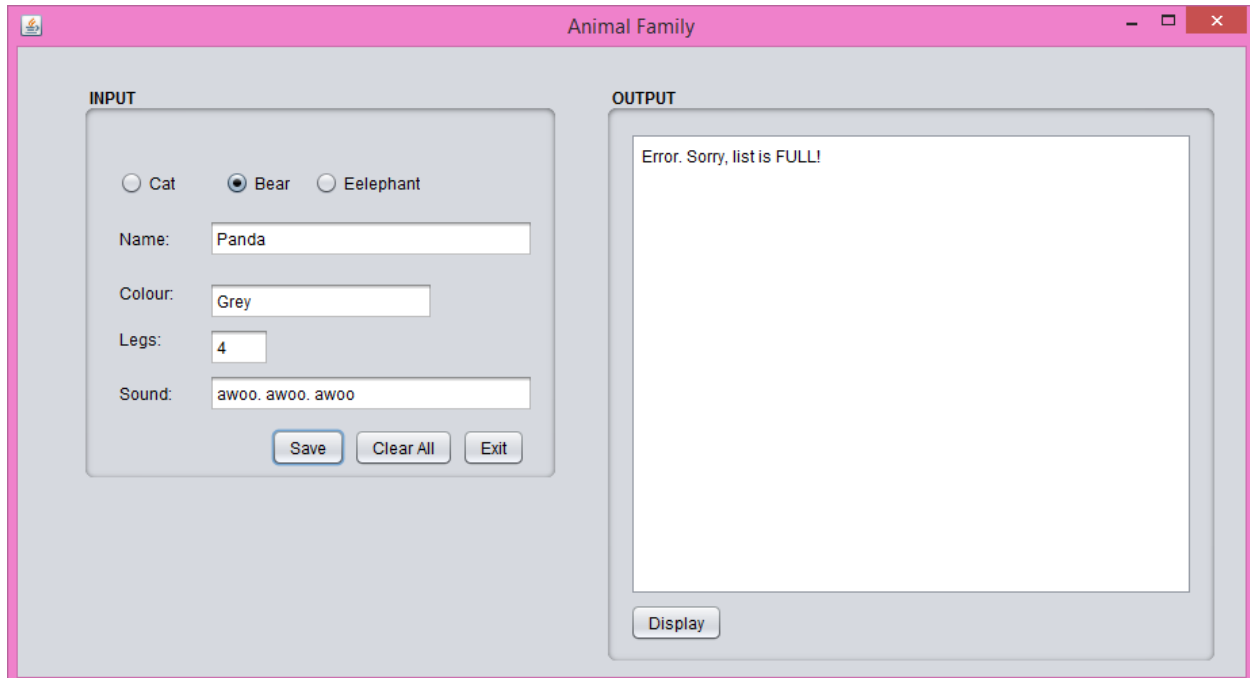
The screenshot shows the 'Animal Family' application window. In the 'INPUT' section, the 'Elephant' radio button is selected. The input fields are: Name: 'Jumbo', Colour: 'Grey', Legs: '4', and Sound: 'Pawoo. Pawoo. Pawoo'. The 'OUTPUT' section displays the following text:

```

Color :white
Pussy is a Carnivore and Meat Eaters/Animal Sources.
Cat likes to eat birds,mice,fish etc.
-----BEAR-----
Name :Grizzly
Number of Legs:4
Sound :Growl. Growl. Growl
Color :Black
Bear is an Omnivore.
Omnivore is similar to both Herbivore and Carnivore.
Bear eats both Plants and also Meat Eaters/Animal Sources.
Bear likes to eat berries, roots, fungi, grasses, fish,
carriion, small mammals, and insects.
-----ELEPHANT-----
Name :Jumbo
Number of Legs:4
Sound :Pawoo. Pawoo. Pawoo
Color :Grey
Jumbo is a Herbivore and eats Plants.
Elephant likes to eat grasses, small plants,
bushes, fruit, twigs, tree bark, and roots.
    
```

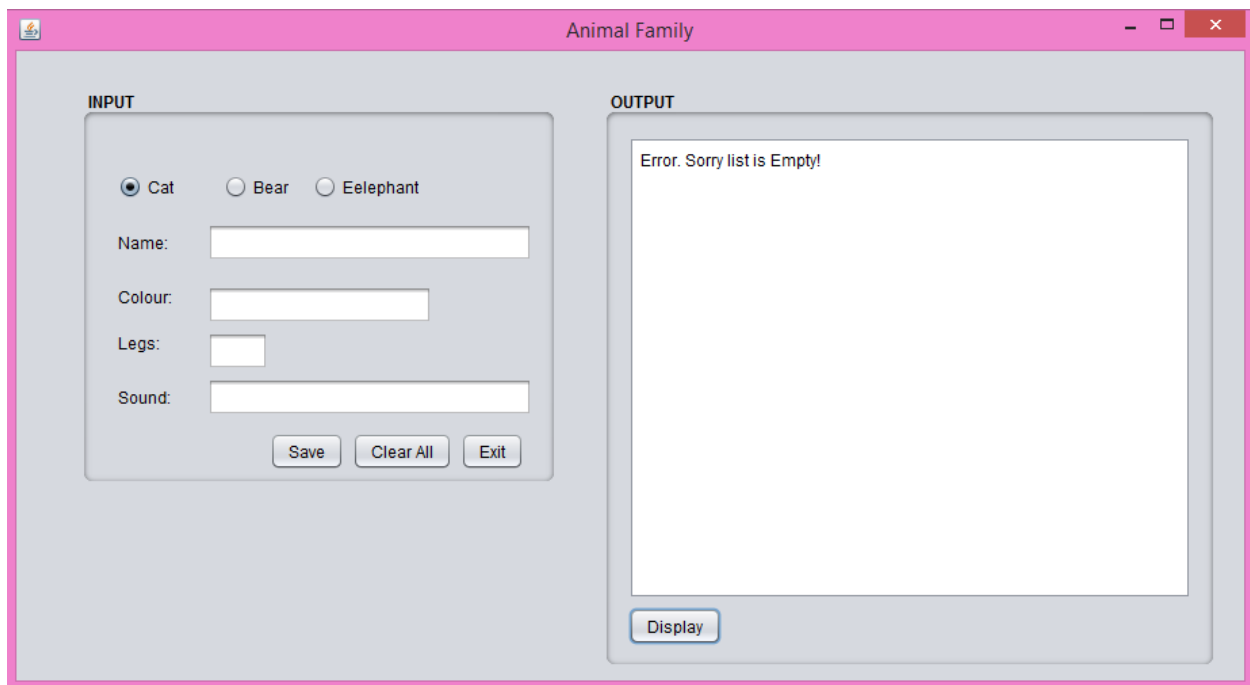
A 'Display' button is located at the bottom of the output area.

4. Your program also needs to handle **TWO (2)** cases:
- List is full** (when user tries to add new object into a full array).



The screenshot shows a window titled "Animal Family" with a pink title bar. It contains two main panels: "INPUT" on the left and "OUTPUT" on the right. In the "INPUT" panel, the "Bear" radio button is selected, and the "Name" field contains "Panda". The "Colour" field contains "Grey", "Legs" contains "4", and "Sound" contains "awoo. awoo. awoo". There are "Save", "Clear All", and "Exit" buttons at the bottom of the input panel. The "OUTPUT" panel shows the message "Error. Sorry, list is FULL!" and a "Display" button at the bottom.

- List is empty** (when user chooses to display an empty array).



The screenshot shows the same "Animal Family" window. In the "INPUT" panel, the "Cat" radio button is now selected, and all text fields ("Name", "Colour", "Legs", "Sound") are empty. The "OUTPUT" panel shows the message "Error. Sorry list is Empty!" and the "Display" button.

Assignment Policy:

- Due date: **29 December 2022**
- Submit: source code + sample outputs
- Assignments that are submitted late are penalized 10% for one day late, 30% for two days late, and will not be accepted thereafter.