CA 3: Experiential Learning

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Problem Statement:

To create a C++ program for an Animal Information System that allows users to choose a particular animal from a given list and learn the basics of it like their diet and the region they are usually found in.

Explanation:

This is a menu-driven code that allows the user to select any animal and get its details, this program contains the following details:

1. Name
2. Place in the Animal Kingdom
3. Type of Blood
4. Diet
5. Places usually found in

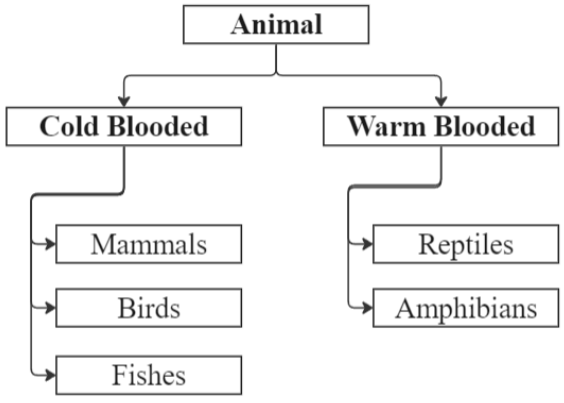
This code was written with the help of multilevel inheritance and polymorphism

Polymorphism is used in 2 ways:

1. Function overriding in a virtual function “virtual void sound_made()”.
2. Dynamic Binding is used while creating an array of pointers in base class animal to store the data of each animal.

Inheritance is used as shown in the diagram below.

Class Diagram:



Code snippets:

```
class Animal {
    public:
        string name, blood, kingdom, food, sounds, reg;

        Animal(string name, string blood, string kingdom, string food, string sounds, string reg)
            : name(name), blood(blood), kingdom(kingdom), food(food), sounds(sounds), reg(reg) {
        }

        virtual void sound_made() {
            cout.setf(ios::left, ios::adjustfield); cout.width(20);
            cout<<"Sound: "<<sounds<<endl;
        }
```

```
Animal* animals[max_animals];

class WarmBlood : public Animal {
    public:
        WarmBlood(string name, string kingdom, string food, string reg, string sounds)
        : Animal(name, "Warm Blooded", kingdom, food, reg, sounds){
        }
};

class ColdBlood : public Animal {
    public:
        ColdBlood(string name, string kingdom, string food, string reg, string sounds)
        : Animal(name, "Cold Blooded", kingdom, food, reg, sounds){
        }
};
```

```
int main(){
    data_mammal();
    data_bird();
    data_fish();
    data_reptile();
    data_amphibians();

    int choice;
    do{
        for(int i=0;i<max_animals;i++){
            cout<<i+1<<". ";
            cout.setf(ios::left, ios::adjustfield);
            cout.width(28);
            cout<<animals[i]->name;
            if((i+1)%4==0){
                cout<<endl;
            }
        }

        cout<<endl<<"\nEnter Choice (1-50 for Animals Mentioned 0 to Exit): ";
        cin>>choice;
        if(choice>=1 && choice<=max_animals){
            animals[choice-1]->put_data();
            cout<<endl;
        }
        else if(choice!=0){
            cout<<"Invalid Option, Choose again"<<endl;
        }
    }while(choice!=0);
}
```

Input/Output:

```
1. Giraffe                  2. Elephant                 3. Humpback Whale          4. Kangaroo
5. Killer Whale             6. Lion                     7. Orangutan               8. Panda
9. Polar Bear               10. Red Fox                 11. American Robin         12. Australian Kookaburra
13. Bald Eagle              14. Common Loon             15. Common Nightingale     16. European Swallow
17. Indian Peafowl          18. Ostrich                 19. Peregrine Falcon       20. Toucan
21. Angelfish               22. Barracuda               23. Catfish                24. Clownfish
25. Mackerel                26. Piranha                 27. Salmon                 28. Swordfish
29. Tuna                    30. Trout                   31. American Alligator     32. Anole Lizard
33. Boa Constrictor         34. Chameleon               35. Galapagos Tortoise     36. Gila Monster
37. Green Iguana            38. King Cobra              39. Komodo Dragon          40. Nile Crocodile
41. African Clawed Frog     42. American Bullfrog       43. European Common        44. Fire-bellied Toad
45. Green Tree Frog         46. Japanese Giant Salamander 47. Moor Frog            48. Red-eyed Tree Frog
49. Spotted Salamander      50. Yellow-eyed Tree Frog

Enter Choice (1-50 for Animals Mentioned 0 to Exit): 42

Animal Name         American Bullfrog
Blood Temperature   Cold Blooded
Kingdom             Amphibians
Diet                Insects, small mammals, and other amphibians
Sound:              Distinctive deep, resonant croaks
Commonly Found In   North America, including the United States and Canada

1. Giraffe                  2. Elephant                 3. Humpback Whale          4. Kangaroo
5. Killer Whale             6. Lion                     7. Orangutan               8. Panda
9. Polar Bear               10. Red Fox                 11. American Robin         12. Australian Kookaburra
13. Bald Eagle              14. Common Loon             15. Common Nightingale     16. European Swallow
17. Indian Peafowl          18. Ostrich                 19. Peregrine Falcon       20. Toucan
21. Angelfish               22. Barracuda               23. Catfish                24. Clownfish
25. Mackerel                26. Piranha                 27. Salmon                 28. Swordfish
29. Tuna                    30. Trout                   31. American Alligator     32. Anole Lizard
33. Boa Constrictor         34. Chameleon               35. Galapagos Tortoise     36. Gila Monster
37. Green Iguana            38. King Cobra              39. Komodo Dragon          40. Nile Crocodile
41. African Clawed Frog     42. American Bullfrog       43. European Common        44. Fire-bellied Toad
45. Green Tree Frog         46. Japanese Giant Salamander 47. Moor Frog            48. Red-eyed Tree Frog
49. Spotted Salamander      50. Yellow-eyed Tree Frog

Enter Choice (1-50 for Animals Mentioned 0 to Exit): 0
```

Github repository link:

https://github.com/Atharva-Gondhali/Animal-Hierarchy