

Philip Pesic

Week 14

November 20 2022

Week 14 Prog 4

(Base and Derived classes should already be coded in part 3.

Create an animal base class.

```
string animalName;
```

```
string sound // Use constructors to set appropriate derived class sound...
```

```
virtual animalSound() { cout << AnimalName << " says " << sound << endl; }
```

Create 4 new derived classes based on animal, that override the virtual function, animalSound, with the specific animal noise,

and assign the animal name to the base animal name variable.

```
cat
```

```
dog
```

```
elephant
```

Philip Pesic

Week 14

November 20 2022

Week 14 Prog 4

mouse

Declare instances of each of the 4 different animals. C1, D1, E1, M1.

Write a function that has one parameter, a derived pointer

The function `void polyNoise( baseClass * ptrBase ) { cout << ptrBase->animalSound;}`

//Note polymorphis - This one line of code should work for ALL/Any of the different derived classes.

Call the function 4 times, pass each animal derived pointer to it and the output should be the correct animal sound.

//

// main.cpp

// Week 14 Prog 4

//

// Created by Pippo Pesic on 11/17/22.

Philip Pesic

Week 14

November 20 2022

Week 14 Prog 4

//

```
#include <iostream>
```

```
#include <string>
```

```
using namespace std;
```

```
class Animal {
```

```
    string animalName;
```

```
    string sound;
```

```
public:
```

```
    Animal(string n, string s) {
```

```
        animalName = n;
```

```
        sound = s;
```

```
    }
```

```
    virtual void animalSound() {
```

```
        cout << animalName << " says " << sound << endl;
```

```
    };
```

```
};
```

```
class Cat : public Animal {
```

```
public:
```

Philip Pesic

Week 14

November 20 2022

Week 14 Prog 4

```
        Cat () : Animal("cat", "meow") {}  
  
};  
  
class Dog : public Animal {  
public:  
        Dog () : Animal("dog", "bark") {}  
  
};  
  
class Elephant : public Animal {  
public:  
        Elephant () : Animal("elephant", "squeal") {}  
  
};  
  
class Mouse : public Animal {  
public:  
        Mouse () : Animal("mouse", "squeak") {}  
  
};  
  
void polyNoise(Animal *pAnimal) {  
        pAnimal->animalSound();  
  
};
```

Philip Pesic

Week 14

November 20 2022

Week 14 Prog 4

```
int main() {  
    char animal;  
  
    Cat c1;  
  
    Dog d1;  
  
    Elephant e1;  
  
    Mouse m1;  
  
  
    Animal *pAnimal = NULL;  
  
  
    cout << "Select an Animal (C, D, E, M) - ";  
    cin >> animal;  
  
  
    switch (animal) {  
        case 'C':  
            pAnimal = &c1;  
            break;  
        case 'D':  
            pAnimal = &d1;  
            break;  
        case 'E':
```

Philip Pesic

Week 14

November 20 2022

Week 14 Prog 4

```
        pAnimal = &e1;

        break;

        case 'M':

            pAnimal = &m1;

            break;

        default:

            cout << "Invalid Animal" << endl;

        }

        polyNoise(pAnimal);

        cout << "Philip Pesic 11/20/22" << endl;

        return 0;

    }
```

Philip Pesic

Week 14

November 20 2022

Week 14 Prog 4

```
1 class Dog : public Animal {
2 public:
3     Dog () : Animal("dog", "bark") {}
4 };
5
6 class Elephant : public Animal {
7 public:
8     Elephant () : Animal("elephant", "sneal") {}
9 };
10
11 class Mouse : public Animal {
12 public:
13     Mouse () : Animal("mouse", "sneak") {}
14 };
15
16 void polyNoise(Animal *animal) {
17     animal->animalSound();
18 };
19
20 int main() {
21     char animal;
22     Cat c1;
23     Dog d1;
24     Elephant e1;
25     Mouse m1;
26
27     Animal *pAnimal = NULL;
28
29     cout << "Select an Animal (C, D, E, M) - ";
30     cin >> animal;
31
32     switch (animal) {
33     case 'C':
34         pAnimal = &c1;
35         break;
36     case 'D':
37         pAnimal = &d1;
38         break;
39     case 'E':
40         pAnimal = &e1;
41         break;
42     case 'M':
43         pAnimal = &m1;
44         break;
45     default:
46         cout << "Invalid Animal" << endl;
47     }
48
49     polyNoise(pAnimal);
50
51     cout << "Philip Pesic 11/20/22" << endl;
52     return 0;
53 }
```

Line: 83 Col: 1

Select an Animal (C, D, E, M) - D  
dog says bark  
Philip Pesic 11/20/22  
Program ended with exit code: 0

I learned: how to create a polymorphic constructor that calls a base constructor