Intro to Computing—CSCI-1310

Sun, Apr 26, 2015 · Lab

Lab 15—Exceptions

Objectives

Use classes, inheritance.
Use exceptions.
Practice pass by reference.

Jurassic Park is a famous movie that we all know of. The movie named after a theme park on Isla Nublar, a tropical island had varieties of cloned Dinosaurs.

It so happened that a park worker was killed by a Velociraptor. Then a team of experts visited the park to certify it as safe. But, now Jurassic Park's computer programmer Dennis Nedry is bribed and deactivates the park's electric fences. This in turn leads the Trex to attack the visitors of the park and also the team of experts.

We will write a program to calculate the number of survivors left in the Park and also to find out if there are enough people left in the park for the Dinosaurs to eat them.

Part 1

Create a base class named `Dinosaur`. It has a public member function named `eatHumans`. eatHumans takes in one parameter as input which is the number of humans present in the park; name it `humans`.

Function signature for `eatHumans()`:

```
void eatHumans(int &humans);
```

This method should print out the total number of visitors present in the park at the beginning before they were eaten up.

Note: `humans` is a reference variable whose value keeps updating.

Part 2

Now create three derived classes which inherit properties of the base class `Dinosaur`.

Name these classes as:

```
Velociraptor
Trex
Brontosaur
```

Modify `eatHumans()` for each of the derived classes to implement the following:

Velociraptor eats one human every hour.
Trex eats two humans every hour.
Brontosaur does not eat human beings and are Herbivores.

Each time the total value of `humans` gets updated and keeps decreasing when they are eaten up.

Part 3

Now the program should throw an exception if the number of victims left are not enough. There should be at least one survivor.

Implement the above condition using `try`, `catch` and `throw`.

Create an empty marker class called `NotEnoughVictimsError`. Your program should catch this exception if the number of the survivor left is 1.

Part 4

In `main` do the following:

Initialise the value of `humans` to be 100.
Create pointer type objects for each of the classes and call `eatHumans()` with `humans` as a parameter passed to it.
Generate a loop inside the try/catch block. The loop is used to execute the `eatHumans()` so long as there are victims present to be attacked. If there are not enough victims then the catch block will print out an error message.

Output

```
1                          Total number of visitors in the park are: 100
2                               The number of victims left are: 99
3                               The number of victims left are: 97
4                            I am an Herbivore. I do not eat humans.
5                               The number of victims left are: 96
6                               The number of victims left are: 94
7                            I am an Herbivore. I do not eat humans.
8                               The number of victims left are: 93
9                               The number of victims left are: 91
```

```
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 90
                                  The number of victims left are: 88
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 87
                                  The number of victims left are: 85
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 84
                                  The number of victims left are: 82
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 81
                                  The number of victims left are: 79
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 78
                                  The number of victims left are: 76
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 75
                                  The number of victims left are: 73
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 72
                                  The number of victims left are: 70
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 69
                                  The number of victims left are: 67
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 66
                                  The number of victims left are: 64
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 63
                                  The number of victims left are: 61
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 60
                                  The number of victims left are: 58
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 57
                                  The number of victims left are: 55
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 54
                                  The number of victims left are: 52
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 51
                                  The number of victims left are: 49
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 48
                                  The number of victims left are: 46
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 45
                                  The number of victims left are: 43
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 42
                                  The number of victims left are: 40
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 39
                                  The number of victims left are: 37
                                I am an Herbivore. I do not eat humans.
                                  The number of victims left are: 36
                                  The number of victims left are: 34
```

```
                        I am an Herbivore. I do not eat humans.
                          The number of victims left are: 33
                          The number of victims left are: 31
                        I am an Herbivore. I do not eat humans.
                          The number of victims left are: 30
                          The number of victims left are: 28
                        I am an Herbivore. I do not eat humans.
                          The number of victims left are: 27
                          The number of victims left are: 25
                        I am an Herbivore. I do not eat humans.
                          The number of victims left are: 24
                          The number of victims left are: 22
                        I am an Herbivore. I do not eat humans.
                          The number of victims left are: 21
                          The number of victims left are: 19
                        I am an Herbivore. I do not eat humans.
                          The number of victims left are: 18
                          The number of victims left are: 16
                        I am an Herbivore. I do not eat humans.
                          The number of victims left are: 15
                          The number of victims left are: 13
                        I am an Herbivore. I do not eat humans.
                          The number of victims left are: 12
                          The number of victims left are: 10
                        I am an Herbivore. I do not eat humans.
                           The number of victims left are: 9
                           The number of victims left are: 7
                        I am an Herbivore. I do not eat humans.
                           The number of victims left are: 6
                           The number of victims left are: 4
                        I am an Herbivore. I do not eat humans.
                           The number of victims left are: 3
                           The number of victims left are: 1
                        I am an Herbivore. I do not eat humans.

                Not enough victims left to eat. Only 1 survivor left in the Park.
```

Lab 15.txt hosted with ❤ by **GitHub** **view raw**

Zip and submit

To get credit for this lab exercise:

Submit the file to Moodle as a zip file named Firstname_Lastname_Lab15.zip
Show the TA your code and run your program.

Midterm 3 review Caching