**Program Design**

*Problem*: The problem to be solved is implementing a program of Zoo Tycoon. Users will choose what animals they want. Random events will occur – births, deaths, or booms in business which will effect the end payoff.

*Structure*:

Animal class header file

Animal class header file will include age, cost, numberOfBabies, baseFoodCost, and payoff variables and getter and setter functions for the variables.

Animal class implementation file will get/set functions.

Tiger, Penguin, and Turtle class files will initialize the variables in different ways depending on requirements in the default constructors.

Zoo header/implementation file will contain the major portion of the program. The randomEvent function will cause the program to generate a random event, and the printPayoff will generate and print the payoff for the day.

Main file will set up the game and ask user what they want to do.

*Test Table*:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case | Input Values | Driver Functions | Expected Outcomes | Observed Outcomes |
| First input: Which animal would you like to buy? | 1, 2, 3 | main()  while loop | Prints error message and loops back to the original question | Prints error message and loops back to the original question |
| Do you want to continue to the next day? | 1 | main()  if statement | Loops back to the original question about buying animals | Loops back to the original question about buying animals |
| Zoo had a random event. | 1 | randomEvent()  random | One of your animals got sick and died (1, tiger, 2, penguin, 3, turtle) | Prints first statement, does not execute nested if/else statements. |
| Zoo had a random event. | 2 | randomEvent()  random | A boom in zoo attendance occurred! And adds a payoff bonus to the tiger. | A boom in zoo attendance occurred! Adds a payoff bonus to the tiger. |
| Zoo had a random event. | 3 | randomEvent()  random | One of your animals had babies (1, tiger, 2, penguin, 3, turtle) | Prints first statement, does not execute nested if/else statements. |
| Zoo had a random event. | 4 | randomEvent()  random | Prints nothing happened. The program does nothing. | Prints nothing happened. The program does nothing. |

**Reflection**

This program is still not working properly for me, however due to time constraints I submitted what I had finished.

The payoff function appears to be working properly, but the nested if/else statements inside my random function for deaths and births are not executing. Despite hours of research, I still cannot figure out why.

I started with a number of issues. I initially had my program add babies, remove/add animals depending on births and deaths and purchases one by one and when that was failing to work, I built functions to do that work.