Midterm #2
CS253 Fall 2017
October 31st, 2017

Your Name:__________________________________________________________

DO NOT OPEN THIS PACKET UNTIL INSTRUCTED TO DO SO

Instructions: You should have two packets. The other packet contains software for you to read. (Everything except main.cpp you have seen before.) This packet contains questions about the code. There is a total of 32 questions totaling 100 points. Some questions are labeled with how many points they are worth. All other questions are worth 2 points. Write your answers in this packet. This packet is what we will grade. You may choose to keep the code packet; otherwise it will be recycled.

The code compiles without errors, using the command g++ -l. main.cpp –o quagga to produce an executable called quagga.

You have 1:15 minutes to complete this exam. It is closed notes, closed books, closed internet, closed calculators, and most of all, closed classmates. If we see you use a cellphone or other potentially internet connected device, you will be assumed to be cheating and receive a score of -100.

When you are done with the test, bring it to the front of the room, show us your Student ID, and hand it in. (Obviously, your face has to match the Student ID, and the name on the test must match the name on the ID.)

Good luck.
Case 1: Executable invoked as: **quagga alpha**

1. What is the first line of output?

2. What is the second line of output?

3. What is the third line of output?

4. What is the fourth line of output?

5. What is the fifth line of output?

6. What is the sixth line of output?

7. What is the seventh line of output?

8. What is the eighth line of output?

9. Is there a memory leak? (Yes/No)

10. How much memory is leaked (by data type and count)? (if the answer above is No, write “none”)

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Case 2: Executable invoked as: **quagga beta**

11. Is there a memory leak? (Yes/No)

12. How much memory is leaked (by data type and count)? (if the answer above is No, write “none”)

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13. Is there an implicit type cast within this case of the switch statement? (Yes/No). If so, write the line of code from main.cpp that includes the implicit cast. (Hint: not the line number; write the actual line of code)
14. The program prints multiple lines of output. Write them in the order printed below (14 pts):

Case 3: Executable invoked as: quagga gamma

15. Is there a memory leak? (Yes/No) __________________________________________________________

16. How much memory is leaked (by data type and count)? (if answer to #8 is No, write “none”)
   __________________________________________________________

17. Does this code crash (Yes/No) __________________________________________________________

18. Is there an implicit type cast within this case of the switch statement? (Yes/No).
   If so, write the line of code from main.cpp that includes the implicit cast. (Hint: not the
   line number; write the actual code) __________________________________________________
   __________________________________________________________

19. The program prints multiple lines of output. Write them in the order printed below (8 pts):
Case 4: Executable invoked as: **quagga delta**

20. Is there a memory leak? (Yes/No) ____________________________________________

21. Does this program crash? (Yes/No). If the answer is Yes, write the line of code in
main.cpp that it crashes on (Again, write the actual line of code): _________________

__________________________________________________________

22. The Quagga class has two constructors: an explicit one that takes an int as an argument,
and an (implicit) copy constructor. How many times is the explicit constructor called?

__________________________________________________________

23. Following up on the question above, how many times is Quagga’s implicit copy
constructor called? ____________________________________________

24. How many times is ZooProperty’s implicit copy constructor called? ________________

25. How many times is Animal’s implicit copy constructor called? _____________________

26. The program prints multiple lines of output. Write them in the order printed below (16
pts):

__________________________________________________________
Case 4: Executable invoked as: **quagga epsilon**

27. Does this program crash? (Yes/No) __________________________________________

28. The program may print multiple lines of output. Write them in the order printed below. If the answer to the previous question is Yes, write the output printed before the program crashes. If it prints nothing, write nothing. (6 pts):

General Questions

29. List the names (if any) of all the pure virtual classes in this code: __________________________

________________________________________________________________________

30. The Quagga class uses multiple inheritance. Are the classes it inherits orthogonal? (Yes/No) __________________________________________

31. List the names (if any) of all the classes in this code that do NOT have a Virtual Function Pointer Table (VFPT): __________________________

________________________________________________________________________

32. List every example (if any) of an overloaded operator in this code: __________________________

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