Assignment #4 – Animal Hierarchy

420-SF2-RE: Data Structures and Object Oriented Programming
May 7, 2025

Late submissions are not accepted! Submissions via MIO are not accepted!

Constraints:

- For this assignment, you may only use what has been covered in class up to and including exceptions.
- You will be graded on the efficiency of your code as well as the design and simplicity. Although the provided examples are small, you should write your code so that your solution is scalable to a larger example. Make sure you adhere to the assignment instructions.
- Make sure your function names and arguments passed to them are exactly as stated in this assignment so that the automated test cases will not fail because of naming functions incorrectly.

- For this assignment you **may not use** any `comprehensions`, the functions: `filter`, `enumerate`, `sort`, `sorted`, opening files using `with`, `global` variables. Doing so will result in a grade of 0 for Assignment#4.
- All `import` statements must be at the top of your `.py` file, then followed by function definitions, then the main program.
- For this assignment you are not allowed to define any extra/helper functions.

Violating any of the above constraints will result in sever deduction of marks and/or a grade of 0 for Assignment#4.

Mandatory Preparation to Assignment#4:

Before getting started on this assignment, you must have the animal hierarchy lab that was started in class completed. A detailed version of the hierarchical diagram can be found on Lea under assignments.

Make sure of the following:

- That the design of your completed hierarchy matches what we did in class
- All functions (except for constructors) have type contracts

- Return types of all functions matches the diagram given
- Pay attention to the design of your code.

Once completed, make a submission. Note that this will be graded. Here are the submission instructions steps:

1. Add, commit, push to git in a folder called Assignment#4 **before May 7**
2. Zip all files into a single folder and submit on Moodle under Assignment#4 Part-1 Submission
3. Submit a .txt file on Moodle with your git link.

Assignment#4 – Part 1:

Part 1: due at the end of class on May 7

- 90% of Assignment#4 grade
- On Git in your Assignment#4 folder you are to add, commit, push all your new `.py` files that you have created to add to the `Animal Hierarchy` files that you already had from our lab.
- On Moodle under Assignment#4 Part-1 Submission you are to upload all your new `.py` files that you have created to add to the `Animal Hierarchy` files that you already had from our lab
- On Moodle under Assignment#4 Part-1 Submission you are to add a .txt file with your git link to Assignment#4 on git.
- **Failure to follow submission instructions properly will result in a grade of 0 for Part-1 of Assignment#4.**

Open the attached diagram. Add to your animal hierarchy the additional classes that have been added in the given diagram that were not part of our lab. More precisely, the classes `Bird` and `Parrot`. All functions (except for constructors) must have type contracts.

The user should be able to build two kinds of `Parrot` object. The first kind: with default number of legs and wings set to 2 for both, and colour set to yellow. The second kind: the number of legs, number of wings and colour are provided by the user. By adding `Parrot` into the hierarchy make sure that superclasses match the design of your `Parrot` object. If any changes that must be made to the superclasses, they should be absolutely minimal/necessary changes.

Note that you will be graded not only on submitting correct code that runs without errors, but also on the design of your code. The design of your final completed hierarchy must match what we did in class, otherwise, will receive a grade of 0 for Assignment#4.

Assignment#4 – Part 2:

Part 2: due May 9 by 16:00

Part 2 of Assignment#4 is a survey to filled out. The survey will be available on Moodle by the end of May 7.   Note that this survey is worth 10% of your Assignment#4. To receive full grades on Part 2, it is mandatory to completely fill this survey by the deadline.