ICS Spring 2017

Lab Exercises Week 5

Exercise 1 – Largest Element using Recursion

Write a recursive function `maximum()` that takes a parameter representing an integer list A and returns the largest element in the list.

Hint: think recursively, the maximum is either the first value in the list, or the maximum of the rest of the list, whichever is larger. If the list has one integer, then its maximum is this single value, naturally. Also, "the rest of the list" above is simply `A[1:len(A)]`

Bonus:

- Implement a non-recursive version
- Use `timeit` to compare recursion, non-recursion and built-in Python function

Exercise 2 – Personal Information Class

Design a class that holds the following personal data: name, address, age, and phone number. Write appropriate accessor and mutator methods. Demonstrate the class by writing a program that creates 3 instances of it. One instance should hold your information, and the other two should hold your friends' or family members' information.

Exercise 3 – Car Class

Write a class named `Car` that has the following data attributes:

- `__year_model`(for the car's year model)
- `__brand`(for the car's brand)
- `__speed`(for the car's current speed)

The Car class should have a `__init__` method that accepts the car's year model and make as arguments. It should also assign `0` to the `__speed` data attribute.

The class should also have the following methods:

- Accelerate: The `accelerate` method add 5 to the speed data attribute.
- Brake: The `brake` method subtract 5 from the speed data attribute.
- The `get_speed` method should return the current speed

Next, Design a program that creates a car object, and then calls the accelerate method 5 times, then break 5 times. After each call display the current speed.

The total travel time is broken into 10 ***random*** length segments, at the end of each segment, there is acceleration or break; first 5 accelerations and then 5 breaks. Output the total distance traveled.

Bonus: Now make the action at the end of a segment a random choice.