Assignment 3
DEV 2 - Year 2015-2016
HOF's

The Dev TEAM

December 23, 2015

1 Goal and description

The goal is to improve your design and implementation skills on high order functions. For this assignment you have to reuse your code form the Assignment 2.

- design and implement the boat data structure
- move through the scene both cars and boats

2 Software requirements

To work with the simulation you need `PyGame 3.4` and `Python 3.4`. You can download the `PyGame 3.4 x86` click me. PyGame is a set of Python modules designed for writing games. The simulation comes with a *template project*. The template is available on N@school and GitHub under the voice `Assignment 1`. reuse the car data structure extend the car with can remove and texture

3 Details

HOF's - revision In the following we show the high order functions needed to solve this assignment: `map` and `filter`.

map is a high order function that takes as parameters a list `l` and a transformation function `f` and returns a *new* list made of all elements of `l` transformed by `f`. In order to use the `map` function the transformation function `f` **must** always the transformed value. In the following example elements of a list of numbers are all increased by one.

```
numbers = Node(1, Node(2, Node(3, Empty)))
new_numbers = map(numbers, lambda n: n + 1)
```

filter is a high order function that takes as parameters a list `l` and a predicate function `p` and returns a new list made of only the elements of `l` that satisfy the predicate `p`. In order to use the `filter` function the predicate `p` must always return a boolean value. In the following example from a list of number we select the even numbers.

```
numbers = Node(1, Node(2, Node(3, Empty)))
new_numbers = map(numbers, lambda n: n % 2 == 0)
```

N.B., You need to study the high order functions and methods for this assignment.

4 Tasks

Task 1 [**HOF** adapt the assignment 2 code so to include HOF's in your code. Precisely, your HOF's should replace your previous *draw all cars/draw all boats* and *update all boats/update all cars*. Design and implement such code.
Hint For drawing your boats and cars you might need an other HOF called `iterate`. The `iterate` function iterates the elements of a list and applies a generic function `f` to all elements of the list.
N.B., The function `iterate` should not change the list dimension or the state of its values. Design such `iterate` function and use it accordingly.

5 Submission and deadline

Contribution: *Groups of 2 students is allowed with individual responsibility*
What: *One PDF per student for all code + comments (comments: explain your code)*
When: *The Friday of week 7*
Where: *On N@school*

GOOD LUCK!!! The Dev TEAM ☺