

```

1  #!/usr/bin/python3.4
2  # -*-coding:Utf-8 -*
3
4  from abc import ABCMeta, abstractmethod
5
6
7  class GeneticElementFactory (metaclass=ABCMeta):
8      """Handle the evolution logic of a GeneticElement
9
10     This is an abstract class to inherit.
11     This is a static class.
12     It brings the evolution logic of the GeneticElement through the following
13     class methods:
14         +create() -> GeneticElement
15         +mutate(GeneticElement)
16         +combine(GeneticElement, GeneticElement) -> GeneticElement
17         +breed(GeneticElement, GeneticElement) -> GeneticElement
18     Evolution logic may typically use recursive process over children of elements.
19     """
20
21     @property
22     @abstractmethod
23     def genetic_element_class (self):
24         """The GeneticElement based class """
25
26         raise NotImplementedError
27
28
29     @staticmethod
30     @abstractmethod
31     def create(parent = None, children = [], cascade = True):
32         """Create a GeneticElement from void
33
34         An essential element of the generation process.
35         This is a static method which has to be implemented.
36
37         return GeneticElement
38         """
39
40         raise NotImplementedError
41
42
43     @staticmethod
44     @abstractmethod
45     def mutate(element):
46         """Operates a genetic mutation
47
48         This is a static method which has to be implemented.
49
50         This is rather designed for internal use, see generate() instead.
51         """
52
53         raise NotImplementedError
54
55
56     @staticmethod
57     def combine(element1, element2):
58         """Form a new GeneticElement, combination of two ones
59
60         Combine two GeneticElement to form an offspring.
61         This is a static method which has to be implemented.
62
63         This is rather designed for internal use, see generate() instead.
64
65         Expects:
66             element1, element2 to be GeneticElement's
67
68         return GeneticElement
69         """
70
71         raise NotImplementedError
72
73
74     @classmethod
75     def breed(cls, element1, element2):
76         """Generate a new GeneticElement, final offspring of two ones
77
78         Call combine() then mutate().
79         This is a class method.
80
81         Expects:
82             element1, element2 to be a GeneticElement's
83
84         return GeneticElement
85         """
86
87         new_element = cls.combine(element1, element2)
88         cls.mutate(new_element)
89         return new_element

```