EXERCISE

Create a python module implementing

- `class Shape(object)`
  - Instance variable: color
- `class Rectangle(Shape)`
  - Instance variable: width, height
  - Methods: calculate_area()
- `class Circle(Shape)`
  - Instance variable: radius
  - Methods: calculate_area()

SOLUTION

```
import numpy as np

class Shape(object):
    num = 0

    def __init__(self, color):
        self.color = color
        Shape.num += 1

    @staticmethod
    def how_many():
        return Shape.num
```

SOLUTION

```
class Rectangle(Shape):

    def __init__(self, width, height, color):
        super(Rectangle, self).__init__(color)
        self.width = width
        self.height = height

    def calculate_area(self):
        return self.width * self.height
```

SOLUTION

```
class Circle(Shape):

    def __init__(self, radius, color):
        super(Circle, self).__init__(color)
        self.radius = radius

    def calculate_area(self):
        return np.pi * self.radius ** 2
```

SOLUTION

```
rect1 = Rectangle(10, 10, 'white')
circ1 = Circle(2, 'blue')

print rect1.calculate_area()
print circ1.calculate_area()
print Shape.how_many()
```

```
>>> >>> 100
12.5663706144
2
```