README

April 6, 2019

```
In [1]: from IPython.display import display, HTML

        display(HTML(data="""
        <style>
            div#notebook-container    { width: 40%; }
            div#menubar-container     { width: 65%; }
            div#maintoolbar-container { width: 99%; }
        </style>
        """))
```

```
<IPython.core.display.HTML object>
```

0.0.1 LAURENT Thomas
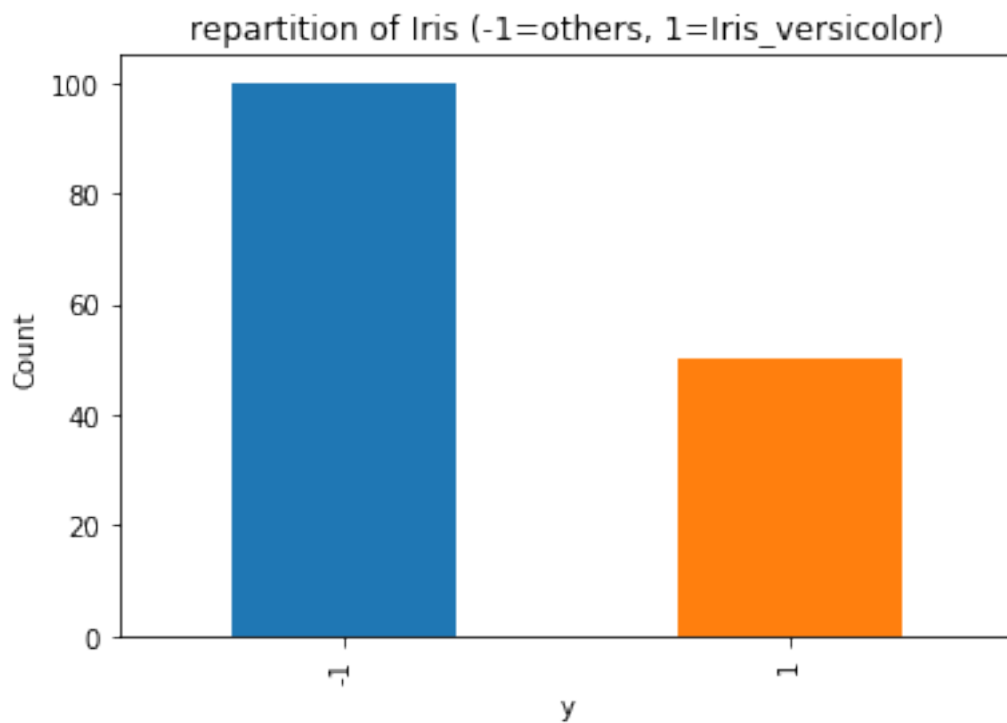
M2 IA
   Apprentissage

```
In [2]: from main import *
        from PlotBuilder import *
```

- 'yielding_pas' mean how many **rows** you learn between each tests process.
- The data is readed in cycle.
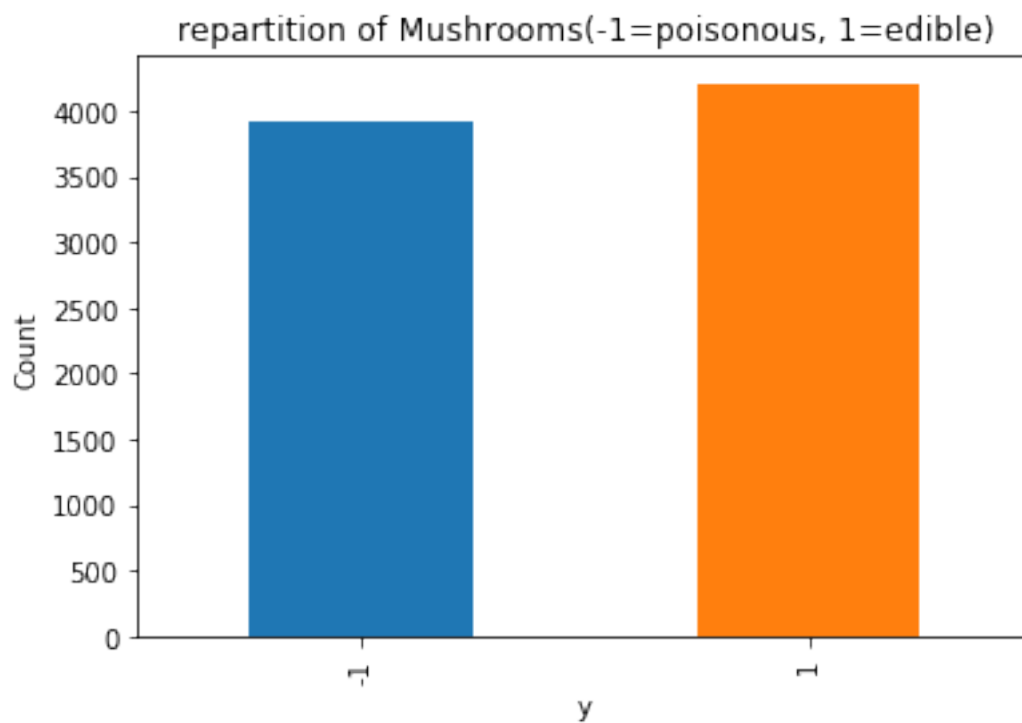- During all testing process we add an other point on the plot graph.

```
In [3]: MAX_PLOT_X_PERCEPTRON = 100
        MAX_PLOT_X = 4500

        iris_X, iris_y = Data.load_iris_data()
        mushroom_X, mushroom_y = Data.load_mushroom_data()
        spambase_X, spambase_y = Data.load_spambase_data()
```
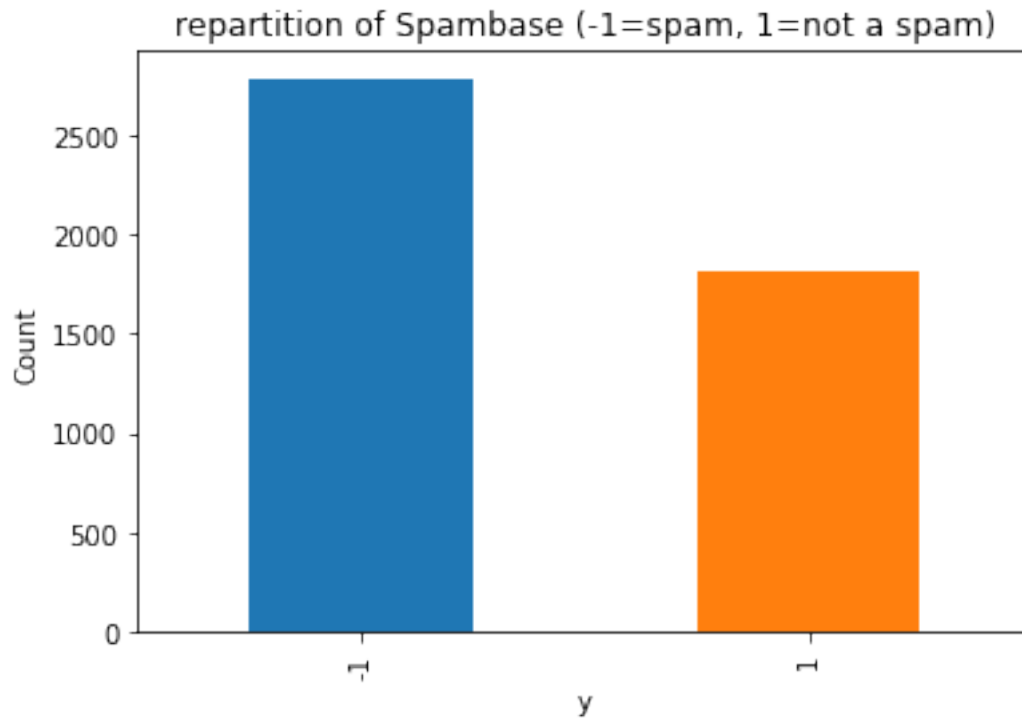
```
In [4]: Plot_builder.y_repartition(iris_y, title="repartition of Iris \
        (-1=others, 1=Iris_versicolor)")
```

repartition of Iris (-1=others, 1=Iris_versicolor)

```
In [5]: Plot_builder.y_repartition(mushroom_y, title="repartition of Mushrooms\
        (-1=poisonous, 1=edible)")
```
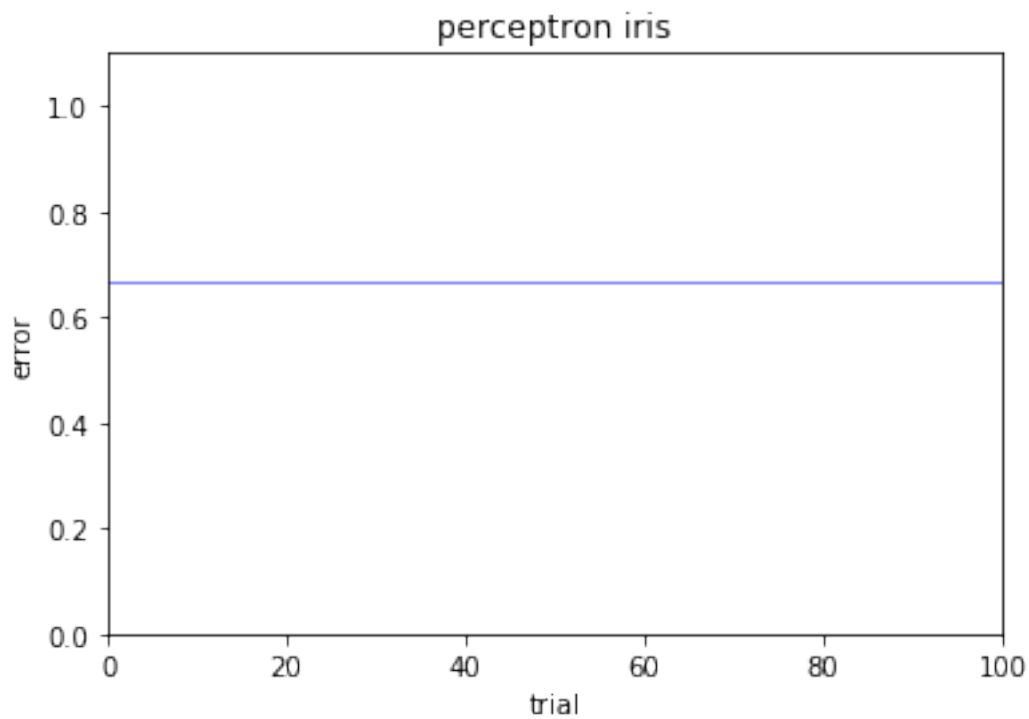

repartition of Mushrooms(-1=poisonous, 1=edible)

```
In [6]: Plot_builder.y_repartition(spambase_y, title="repartition of Spambase \
        (-1=spam, 1=not a spam)")
```


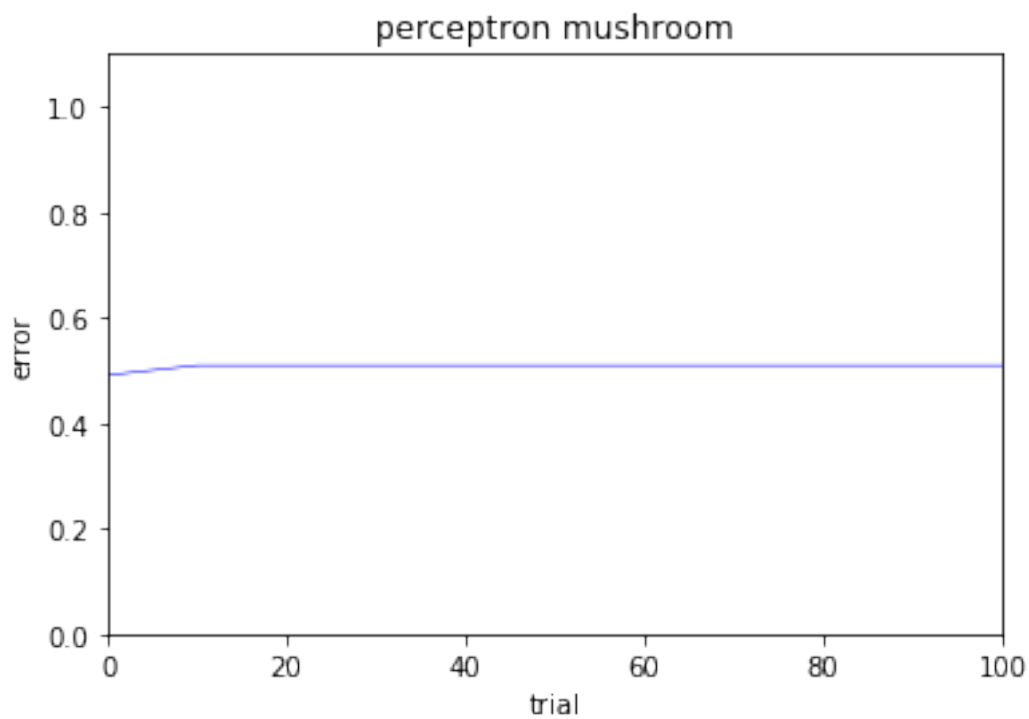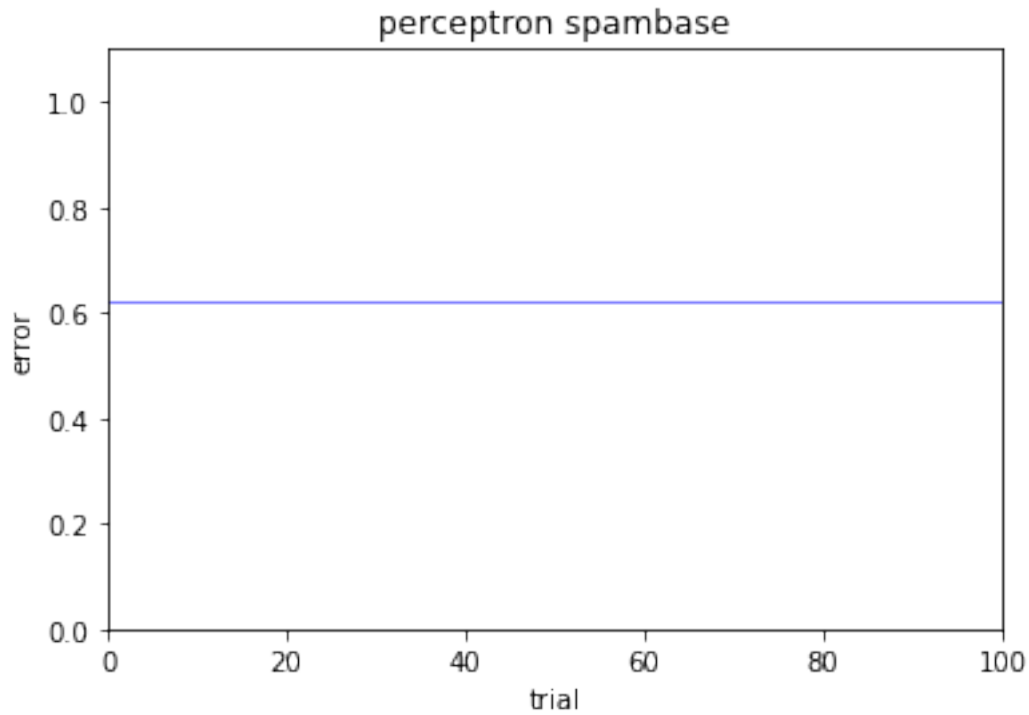repartition of Spambase (-1=spam, 1=not a spam)

1 Perceptron

```
In [7]: perceptron = Algo(iris_X, iris_y, algo=Perceptron, yielding_pas=10)
        perceptron.do_all(nb_iterations=MAX_PLOT_X_PERCEPTRON,name="perceptron iris",
                          max_x=MAX_PLOT_X_PERCEPTRON)
```

perceptron iris

```
In [8]: perceptron = Algo(mushroom_X, mushroom_y, algo=Perceptron, yielding_pas=10)
        perceptron.do_all(nb_iterations=MAX_PLOT_X_PERCEPTRON,
                          name="perceptron mushroom", max_x=MAX_PLOT_X_PERCEPTRON)
```

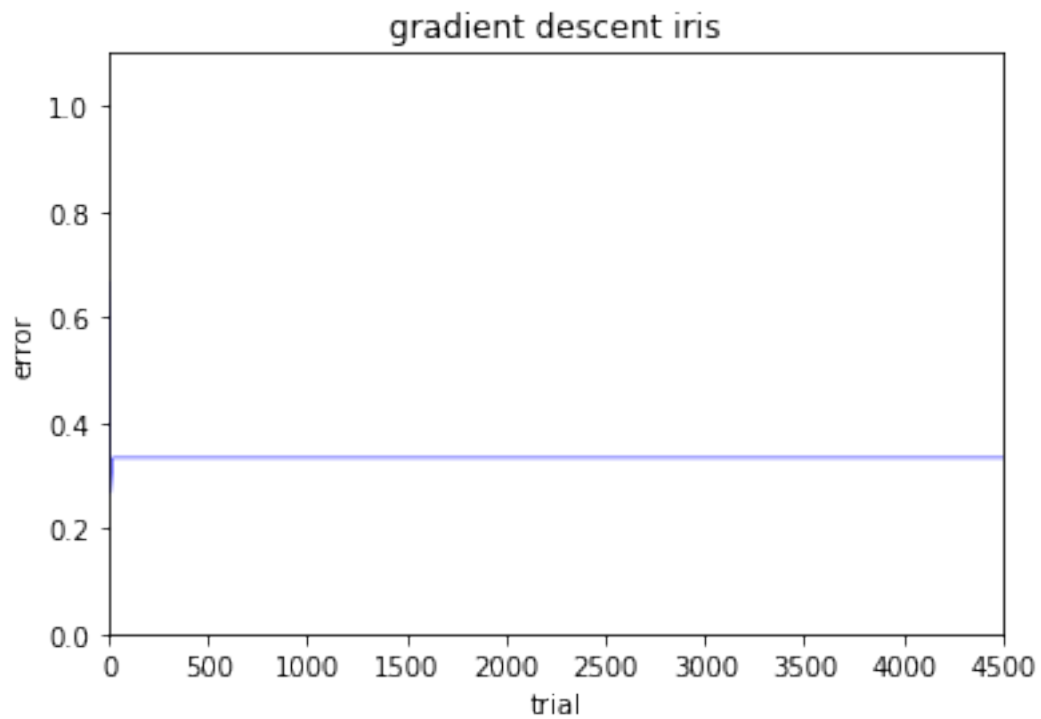## perceptron mushroom

```
In [9]: perceptron = Algo(spambase_X, spambase_y, algo=Perceptron, yielding_pas=10)
        perceptron.do_all(nb_iterations=MAX_PLOT_X_PERCEPTRON,
                          name="perceptron spambase", max_x=MAX_PLOT_X_PERCEPTRON)
```
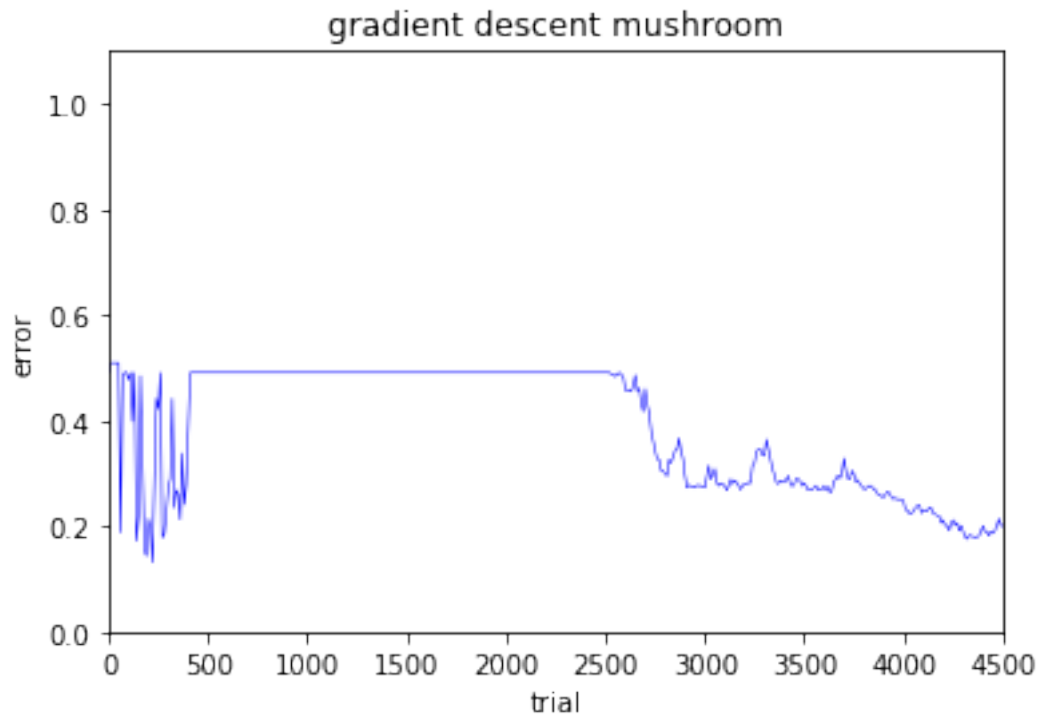

2 Descent gradient
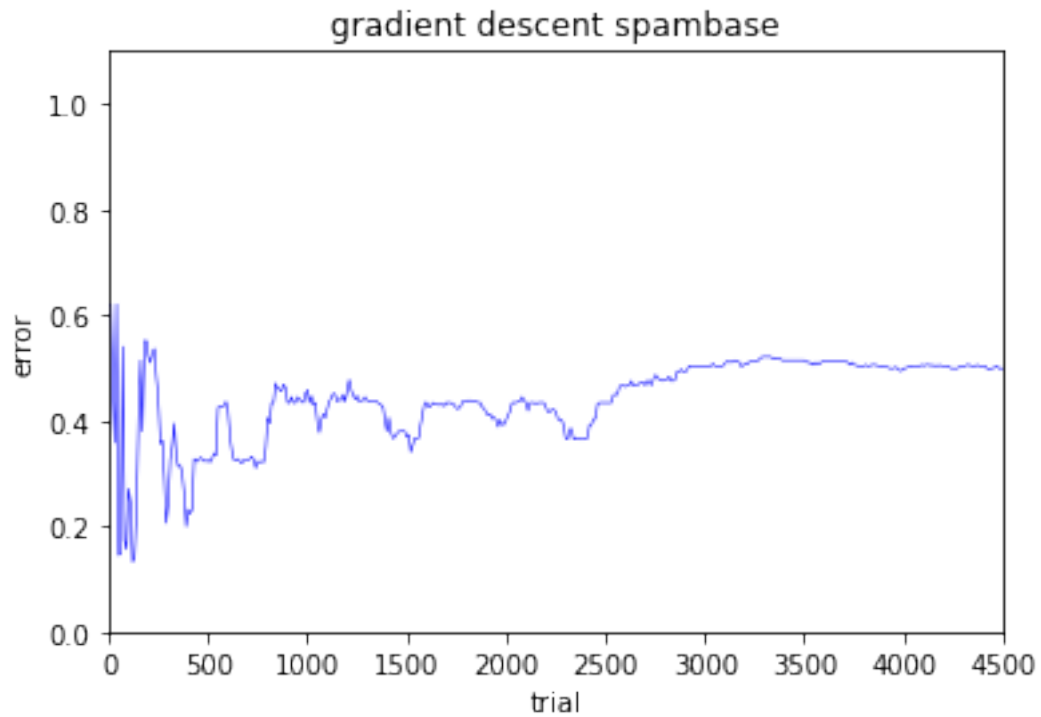
```
In [10]: gradient_descent = Algo(iris_X, iris_y, algo=GradientDescent,
                                 yielding_pas=10, gradient_eta=2)
         gradient_descent.do_all(nb_iterations=MAX_PLOT_X,
                                 name="gradient descent iris", max_x=MAX_PLOT_X)
```

gradient descent iris

```
In [11]: gradient_descent = Algo(mushroom_X, mushroom_y, algo=GradientDescent,
                                 yielding_pas=10, gradient_eta=2)
         gradient_descent.do_all(nb_iterations=MAX_PLOT_X,
                                 name="gradient descent mushroom", max_x=MAX_PLOT_X)
```

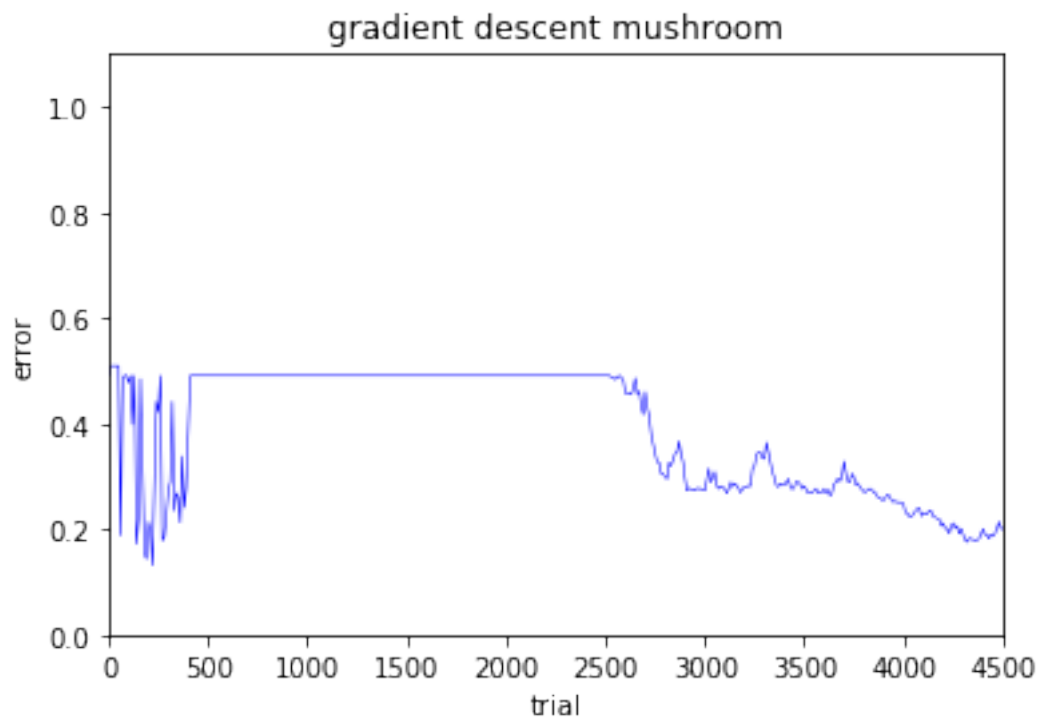gradient descent mushroom
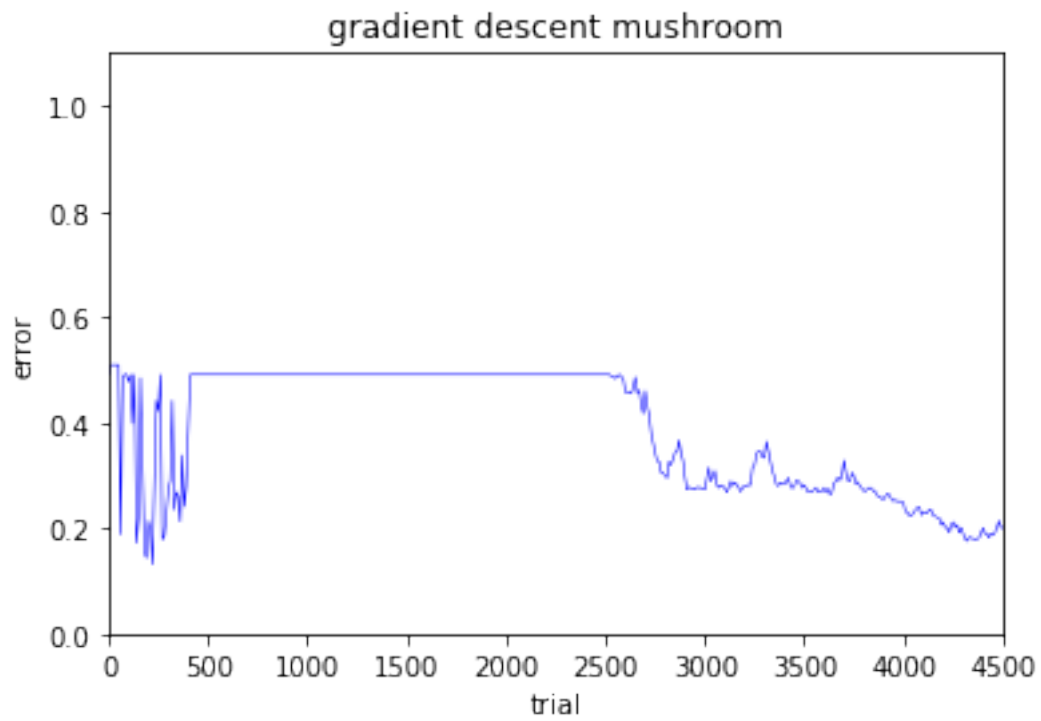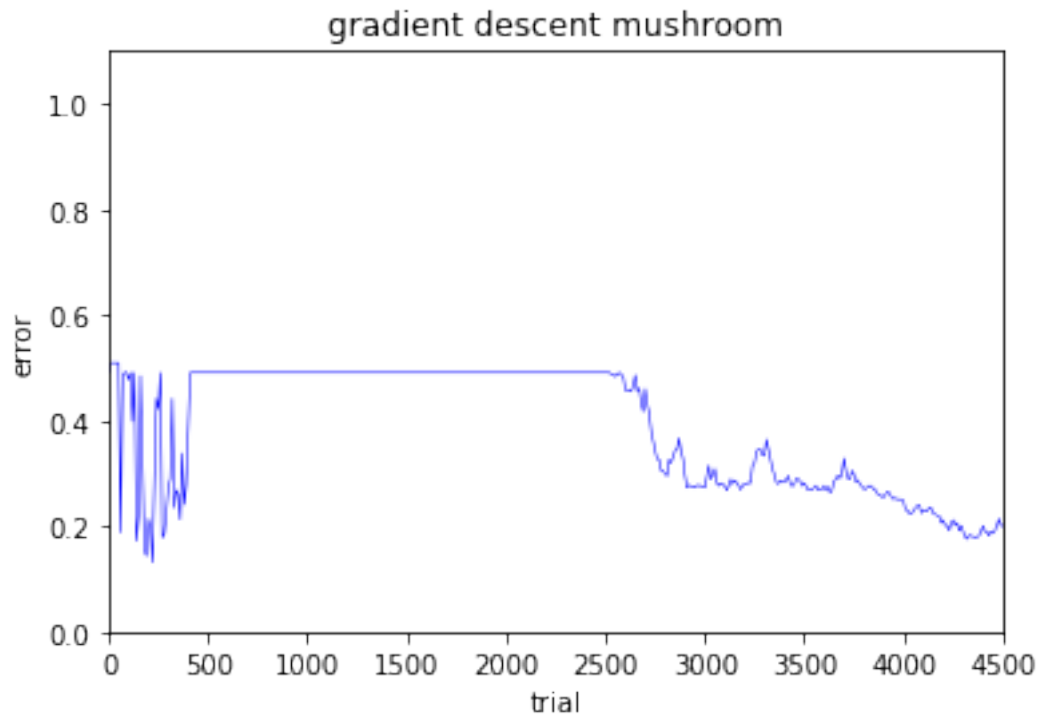
```
In [12]: gradient_descent = Algo(spambase_X, spambase_y, algo=GradientDescent,
                              yielding_pas=10, gradient_eta=2)
         gradient_descent.do_all(nb_iterations=MAX_PLOT_X,
                              name="gradient descent spambase", max_x=MAX_PLOT_X)
```

gradient descent spambase
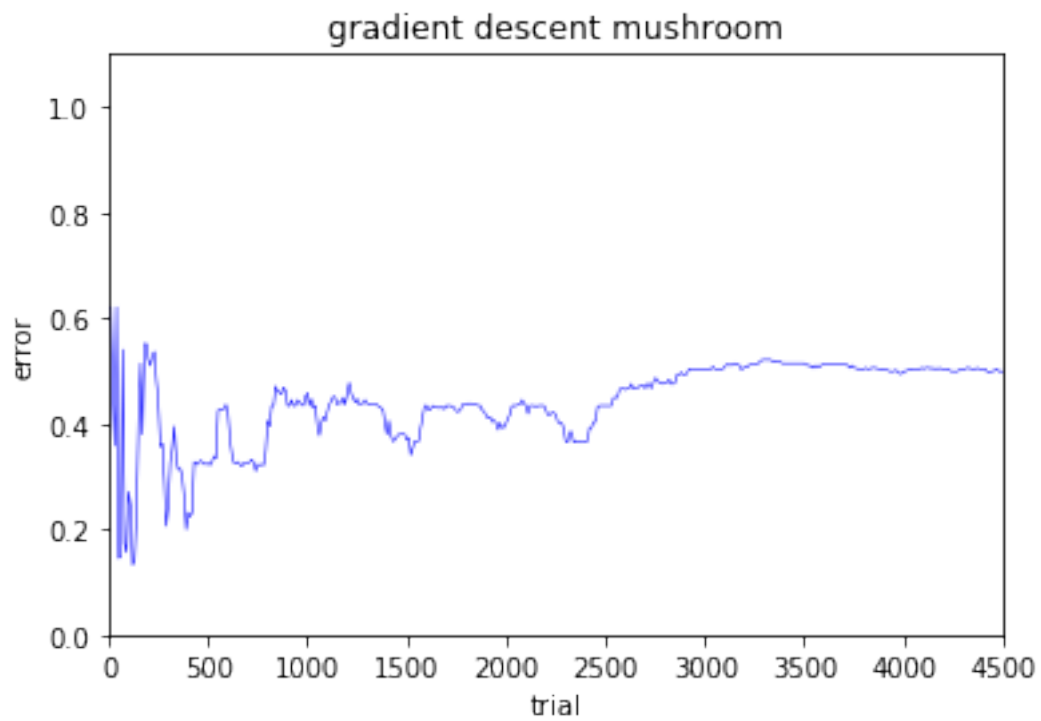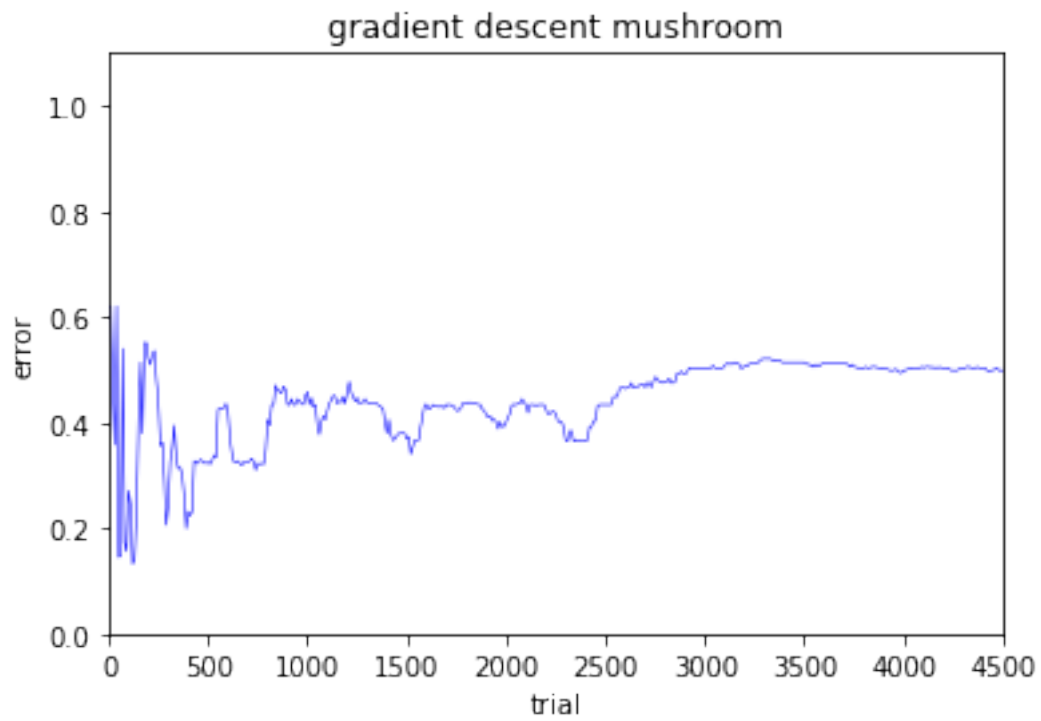
3 searching for best ETA

```
In [15]: for eta in [-1000,1,-1000]:
             gradient_descent = Algo(mushroom_X, mushroom_y,
                                 algo=GradientDescent, yielding_pas=10,
                                 gradient_eta=eta)
             gradient_descent.do_all(nb_iterations=MAX_PLOT_X,
                                 name="gradient descent mushroom",
                                 max_x=MAX_PLOT_X)
```
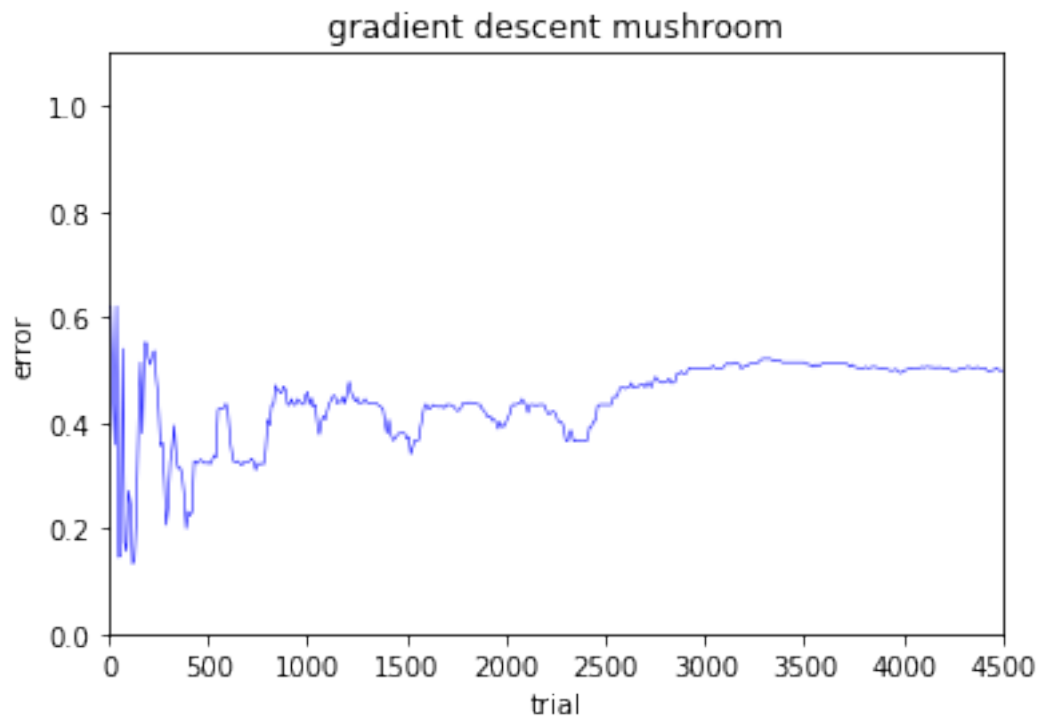
gradient descent mushroom

gradient descent mushroom

9

gradient descent mushroom


```
In [16]: for eta in [-1000,1,1000]:
             gradient_descent = Algo(spambase_X, spambase_y, algo=GradientDescent,
                                     yielding_pas=10, gradient_eta=eta)
             gradient_descent.do_all(nb_iterations=MAX_PLOT_X,
                                     name="gradient descent mushroom",
                                     max_x=MAX_PLOT_X)
```

gradient descent mushroom

gradient descent mushroom

gradient descent mushroom

Notting change, i tried to test with eta = (0.7,0.2,-0.2,-.07) and range(1,10000,100)