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In [1]:

```
#問1
def calc(n):
    res = 0
    for i in range(n):
        for j in range(i):
            res+=j
    return res
#オーダーはn^2
```

In [2]:

```
import time

def timeck(n):
    t1 = time.time()
    calc(n)
    t2 = time.time()
    etime = t2-t1
    return etime
```

In [3]:

```
import scipy.optimize
import matplotlib.pyplot as plt
%matplotlib inline
l = []
m = [0,1,2,3,4,5,6,7,8,9,10]
for n in range(11):
    l.append(timeck(1000*n))
    n +=1
```

In [4]:

```
import numpy as np

def func(x,a,b,c):
    return a*x**2 + b*x + c

result,covariance=scipy.optimize.curve_fit(func,m,l)
print('a =', result[0])
print('b =', result[1])
print('c =', result[2])
x = np.arange(0, 10, 0.1)
y = (result[0] * x **2) + (result[1] * x) + result[2]
plt.scatter(m, l, alpha=0.5)
plt.plot(x,y)
```

```
a = 0.0209900087944
b = -0.000948987531727
c = -0.00553432711575
```

Out[4]:

```
[<matplotlib.lines.Line2D at 0x2af1900f208>]
```