Premiere-Corrige-PartieSuite2-ExemplesCours

April 1, 2020

0.1 Première Partie Suites nř2 Corrigé des exemples du cours

```
In [1]: %matplotlib inline
```

```
In [3]: import matplotlib.pyplot as plt
        from math import sqrt



        ##Graphique

        def graphique(n, suite):
          x = list(range(n))
          y = [suite(k) for k in x]
          plt.clf()
          plt.plot(x, y,'b.')
          plt.title(f'{suite.__name__}-{n}-points')
          plt.savefig(f'{suite.__name__}-{n}-points.png')
```

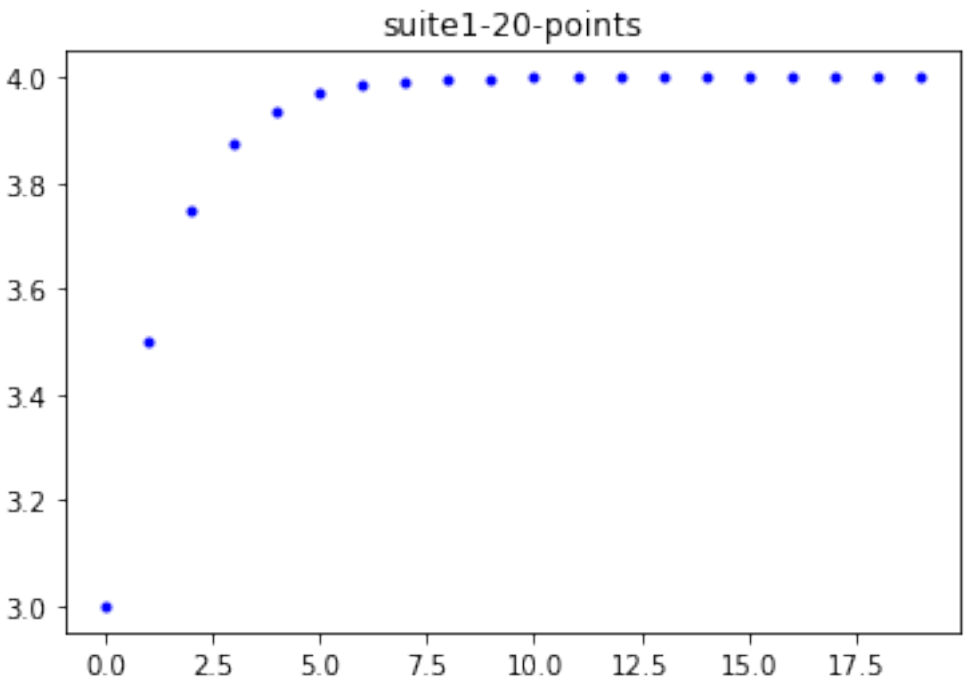
0.2 Exemple 1

$\forall n \in \mathbb{N}$, $u_n = 4 - 0,5^n$

On peut conjecturer que cette suite converge vers 4

```
In [4]: def suite1(n):
          return 4 - 0.5 ** n


        graphique(20, suite1)
```



0.3 Exemple 2

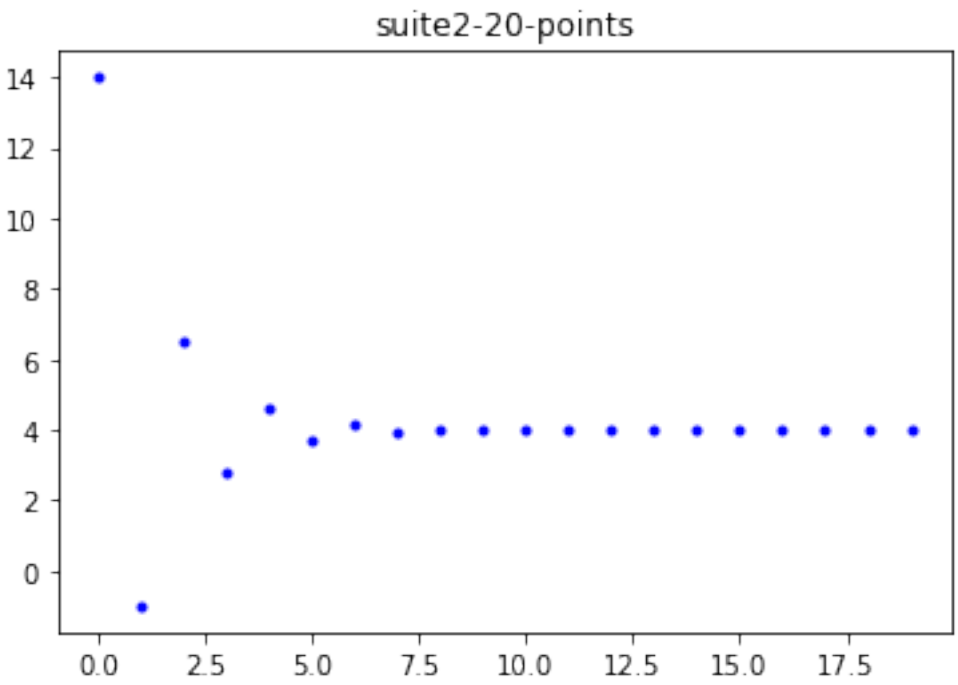
$\forall n \in \mathbb{N}$, $v_n = 4 + 10 \times (-0,5)^n$

On peut conjecturer que cette suite converge vers 4

```
In [5]: ## Exemple 2

        def suite2(n):
          return 4 + 10 * (-0.5) ** n


        graphique(20, suite2)
```



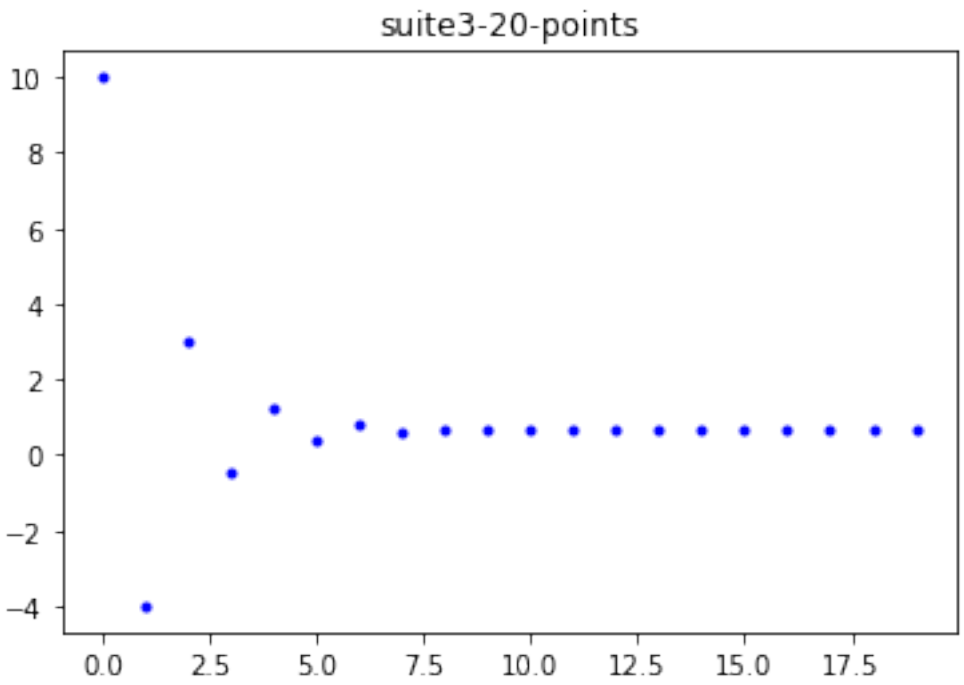
0.4 Exemple 3

$u_0 = 10$ et $\forall n \in \mathbb{N}$, $u_{n+1} = -0,5u_n + 1$

On peut conjecturer que cette suite converge vers 0.

```
In [7]: def suite3(n):
            u = 10
            for k in range(n):
              u = -0.5 * u + 1
            return u

        graphique(20, suite3)
```



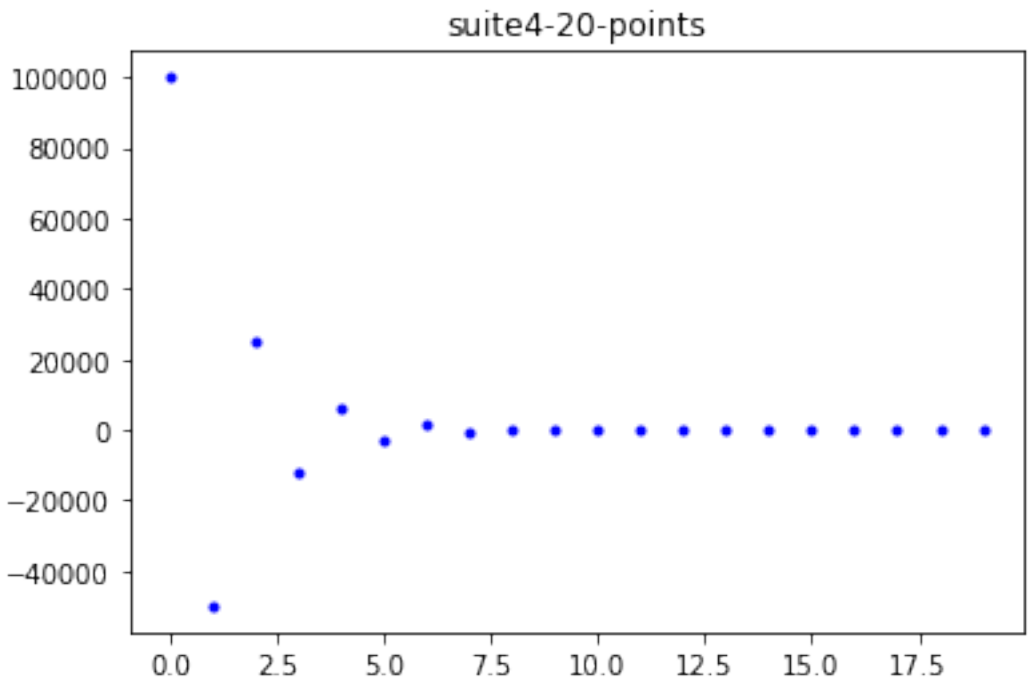
0.5 Exemple 4

$u_0 = 100000$ et $\forall n \in \mathbb{N}$, $u_{n+1} = -0,5u_n + 1$

On peut conjecturer que cette suite converge vers 0.

```
In [8]: def suite4(n):
            u = 100000
            for k in range(n):
              u = -0.5 * u + 1
            return u

        graphique(20, suite4)
```



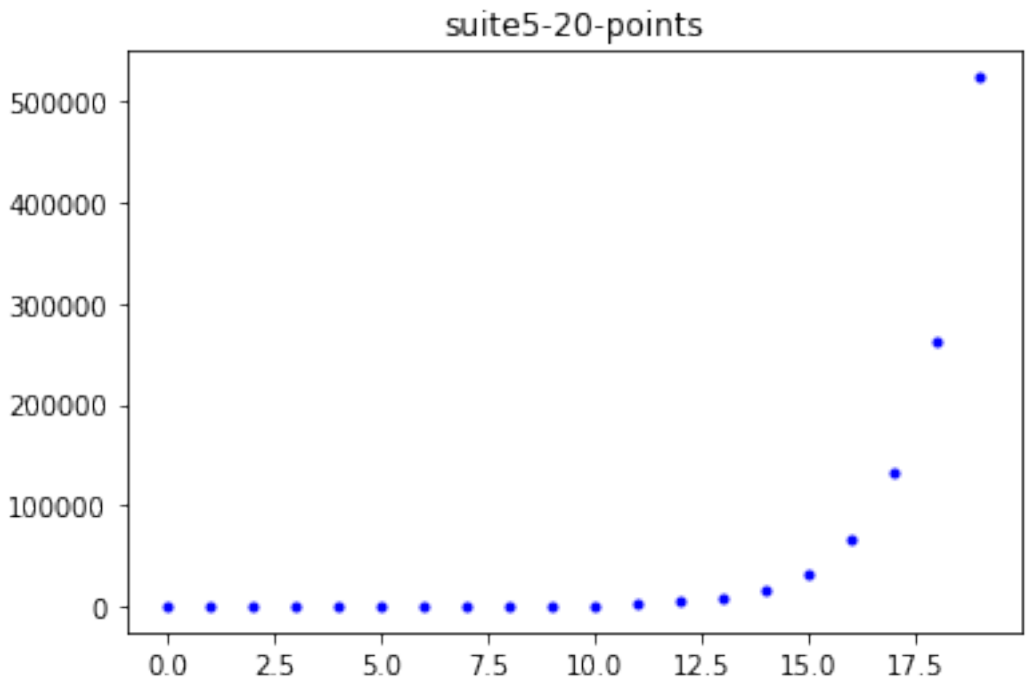
0.6 Exemple 5

$u_0 = 0,0001$ et $\forall n \in \mathbb{N}$, $u_{n+1} = 2u_n + 1$

On peut conjecturer que cette suite diverge vers $+\infty$

```
In [9]: def suite5(n):
            u = 0.0001
            for k in range(n):
              u = 2 * u + 1
            return u

        graphique(20, suite5)
```



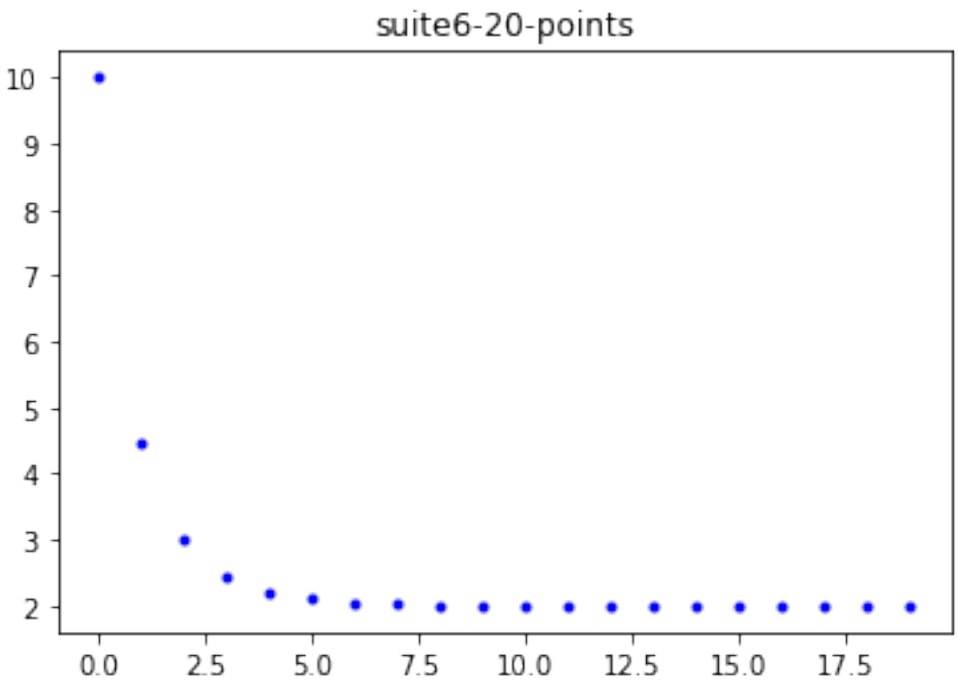
0.7 Exemple 6

$u_0 = 10$ et $\forall n \in \mathbb{N}$, $u_{n+1} = \sqrt{2u_n}$

On peut conjecturer que cette suite converge vers 2

```
In [10]: def suite6(n):
             u = 10
             for k in range(n):
               u = sqrt(2 * u)
             return u

         graphique(20, suite6)
```



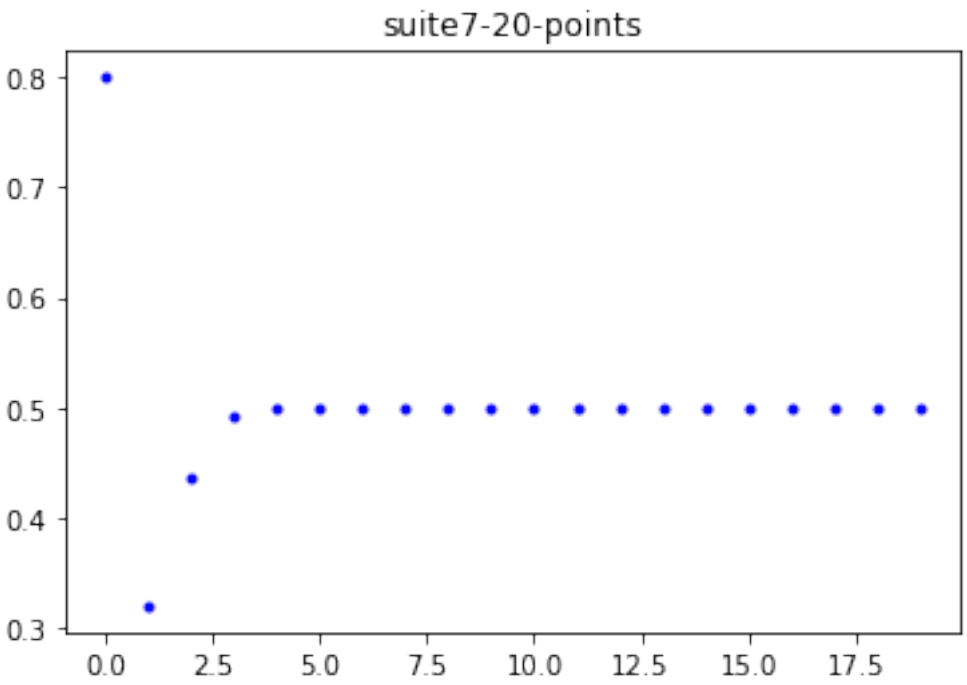
0.8 Exemple 7

$u_0 = 0,8$ et $\forall n \in \mathbb{N}$, $u_{n+1} = 2u_n(1 - u_n)$

On peut conjecturer que cette suite converge vers $0,5$

```
In [11]: def suite7(n):
             u = 0.8
             for k in range(n):
               u = 2 * u * (1 - u)
             return u

         graphique(20, suite7)
```



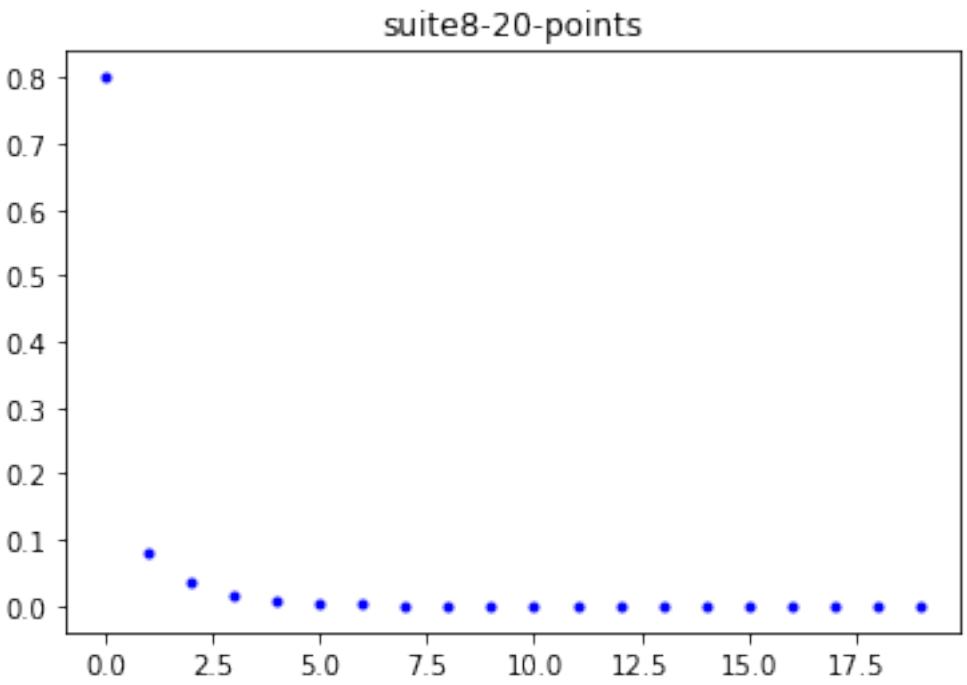
0.9 Exemple 8

$u_0 = 0,8$ et $\forall n \in \mathbb{N}$, $u_{n+1} = 0,5u_n(1-u_n)$

On peut conjecturer que cette suite converge vers 0

```
In [12]: def suite8(n):
             u = 0.8
             for k in range(n):
               u = 0.5 * u * (1 - u)
             return u

         graphique(20, suite8)
```



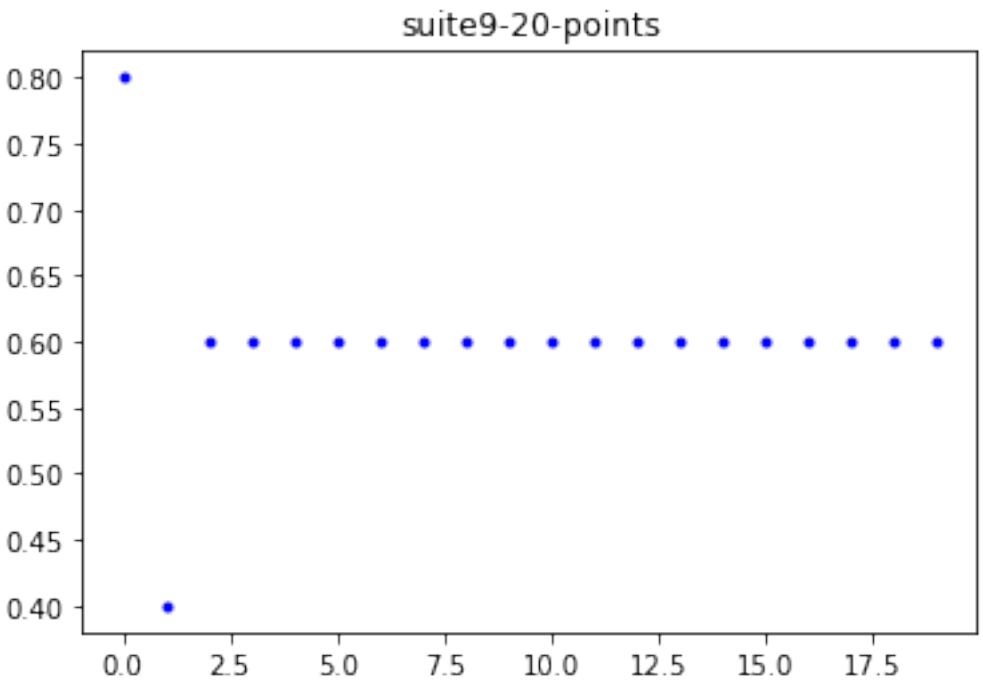
0.10 Exemple 9

$u_0 = 0,8$ et $\forall n \in \mathbb{N}$, $u_{n+1} = 2,5u_n(1-u_n)$

On peut conjecturer que cette suite converge vers $0,6$.

```
In [18]: def suite9(n):
             u = 0.8
             for k in range(n):
               u = 2.5 * u * (1 - u)
             return u

         graphique(20, suite9)
```



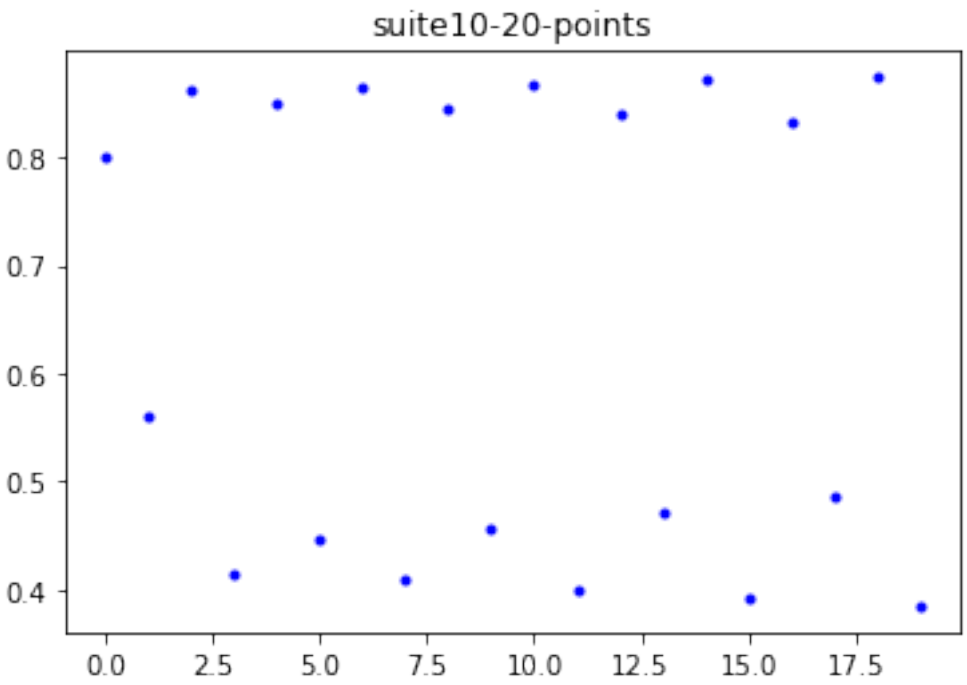
0.11 Exemple 10

$u_0 = 0,8$ et $\forall n \in \mathbb{N}$, $u_{n+1} = 3,5u_n(1-u_n)$

On peut conjecturer que cette suite n'a pas de limite

```
In [19]: def suite10(n):
             u = 0.8
             for k in range(n):
               u = 3.5 * u * (1 - u)
             return u

         graphique(20, suite10)
```


suite10-20-points
0.8
0.7
0.6
0.5
0.4
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5