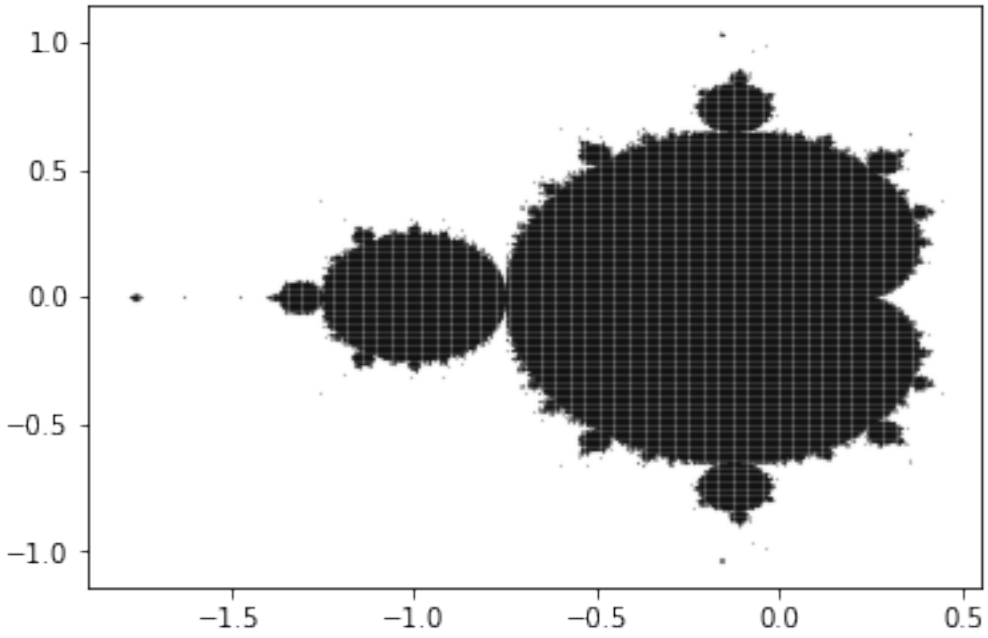
Questao1

October 6, 2019

1 Densidade do conjunto de Mandelbrot

[1]:
```
from pylab import plot, scatter, xlabel, ylabel, xlim, ylim
from numpy import linspace
%matplotlib inline

N = 1000

X = linspace(-2, 2, N, endpoint=True)
Y = linspace(-2, 2, N, endpoint=True)

iter_qtt = 100

mandel_subsetX = []
mandel_subsetY = []

for x in X:
    for y in Y:
        c = x + 1j*y
        z = c

        for _ in range(iter_qtt):
            z = z**2 + c

            if abs(z)>=2: break

        if abs(z)<2:
            mandel_subsetX.append(x)
            mandel_subsetY.append(y)

scatter(mandel_subsetX, mandel_subsetY, s=.01, c='k')
```

[1]:
```
<matplotlib.collections.PathCollection at 0x7f71de1a4ac8>
```



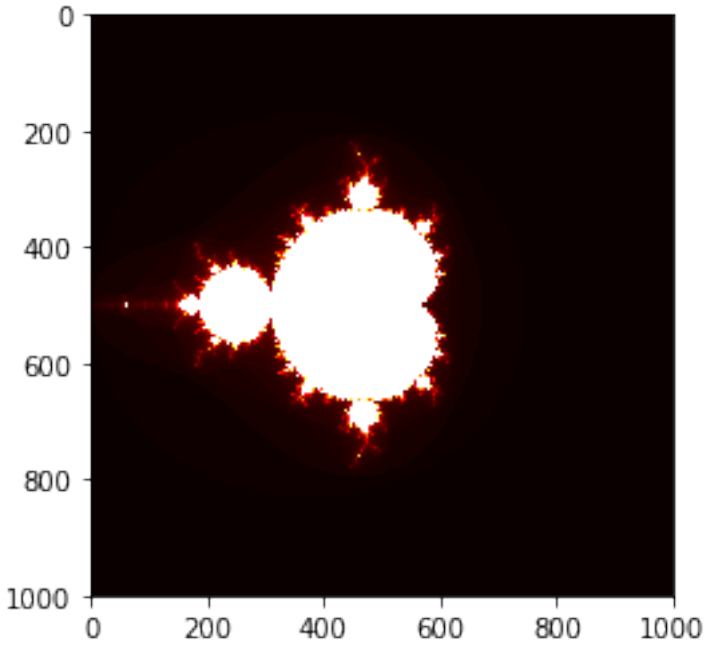
2 Imagens mais bonitas

[2]:
```
from pylab import imshow, show
from numpy import array
```

2.1 Hot

[3]:
```
from pylab import hot

mandel_frac = []

for x in X:
    mandel_line = []
    for y in Y:
        c = x + 1j*y
        z = c

        for i in range(iter_qtt):
            z = z**2 + c
            if abs(z)>=2:break

        mandel_line.append(i)
```

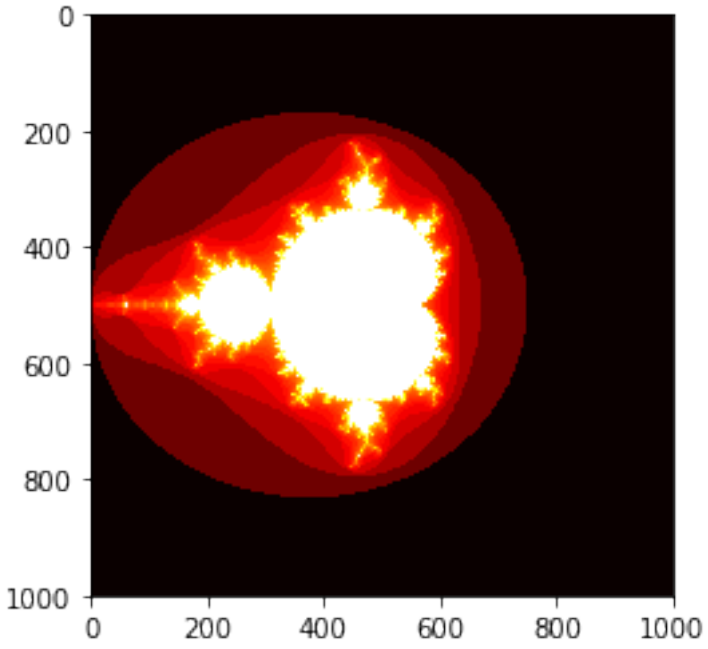
```
    mandel_frac.append(mandel_line)

imshow(array(mandel_frac).T)
hot()
show()
```



2.1.1 Log

[4]:
```
from numpy import log

mandel_frac = []

for x in X:
    mandel_line = []
    for y in Y:
        c = x + 1j*y
        z = c

        for i in range(iter_qtt):
            z = z**2 + c
            if abs(z)>=2:break

        mandel_line.append(log(i+1))
```

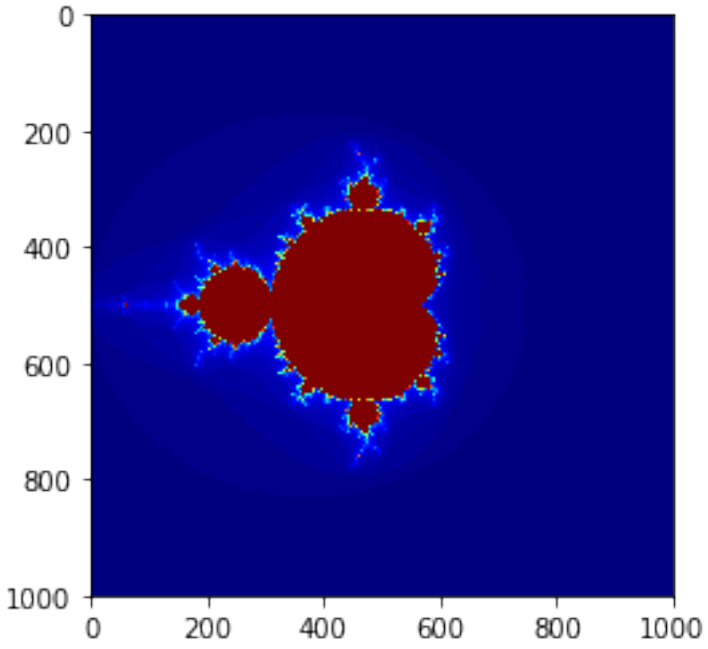
```
    mandel_frac.append(mandel_line)

imshow(array(mandel_frac).T)
hot()
show()
```



2.2 Jet

[5]:
```
from pylab import jet

mandel_frac = []

for x in X:
    mandel_line = []
    for y in Y:
        c = x + 1j*y
        z = c

        for i in range(iter_qtt):
            z = z**2 + c
            if abs(z)>=2:break

        mandel_line.append(i)
```

```
    mandel_frac.append(mandel_line)

imshow(array(mandel_frac).T)
jet()
show()
```



2.2.1 Log

[6]:
```
mandel_frac = []

for x in X:
    mandel_line = []
    for y in Y:
        c = x + 1j*y
        z = c

        for i in range(iter_qtt):
            z = z**2 + c
            if abs(z)>=2:break

        mandel_line.append(log(i+1))

    mandel_frac.append(mandel_line)
```

```
imshow(array(mandel_frac).T)
jet()
show()
```