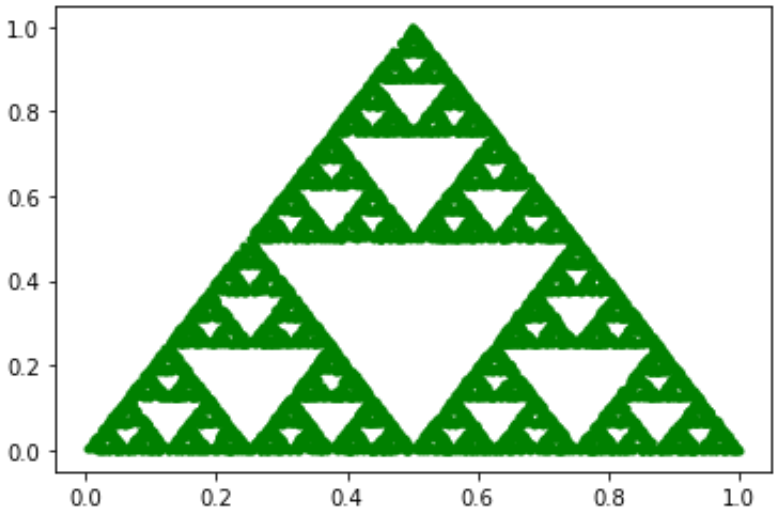
```
import random
import matplotlib.pyplot as plt
from matplotlib import animation


def plot(points):

    xx = [x for (x, y) in points]
    yy = [y for (x, y) in points]

    plt.plot(xx, yy, 'g.')
    plt.show()


def do_animation(points):

    xx = [x for (x, y) in points]
    yy = [y for (x, y) in points]

    fig = plt.figure()

    def init():
        ax = plt.axes(xlim=(0, 1), ylim=(0, 1))
        return ax.plot(xx, yy, 'g.')

    def animate(i):
        scale = 1 - i * 0.02
        ax = plt.axes(xlim=(0, scale), ylim=(0, scale))
        return ax.plot(xx, yy, 'g.')

    anim = animation.FuncAnimation(
        fig, animate, init_func=init, frames=50, interval=200,
    anim.save('sierpinski_10000.gif', writer='pillow')

    plt.show()


def sierpinski(n, animate=False):

    vertices = [(0.0, 0.0), (0.5, 1.0), (1.0, 0.0)]
    points = []
```

```
    # initial vertex
    x, y = random.choice(vertices)

    for i in range(n):

        # select new vertex
        vx, vy = random.choice(vertices)

        # get middle point
        x = (vx + x) / 2.0
        y = (vy + y) / 2.0

        points.append((x, y))

    if animate:
        do_animation(points)
    else:
        plot(points)


sierpinski(n=10000, animate=False)
```



```
1 sierpinski(n=1000, animate=True)
```

```
/usr/local/lib/python3.6/dist-packages/ipykernel_launcher.py:28: Matpl
```