Homework 3

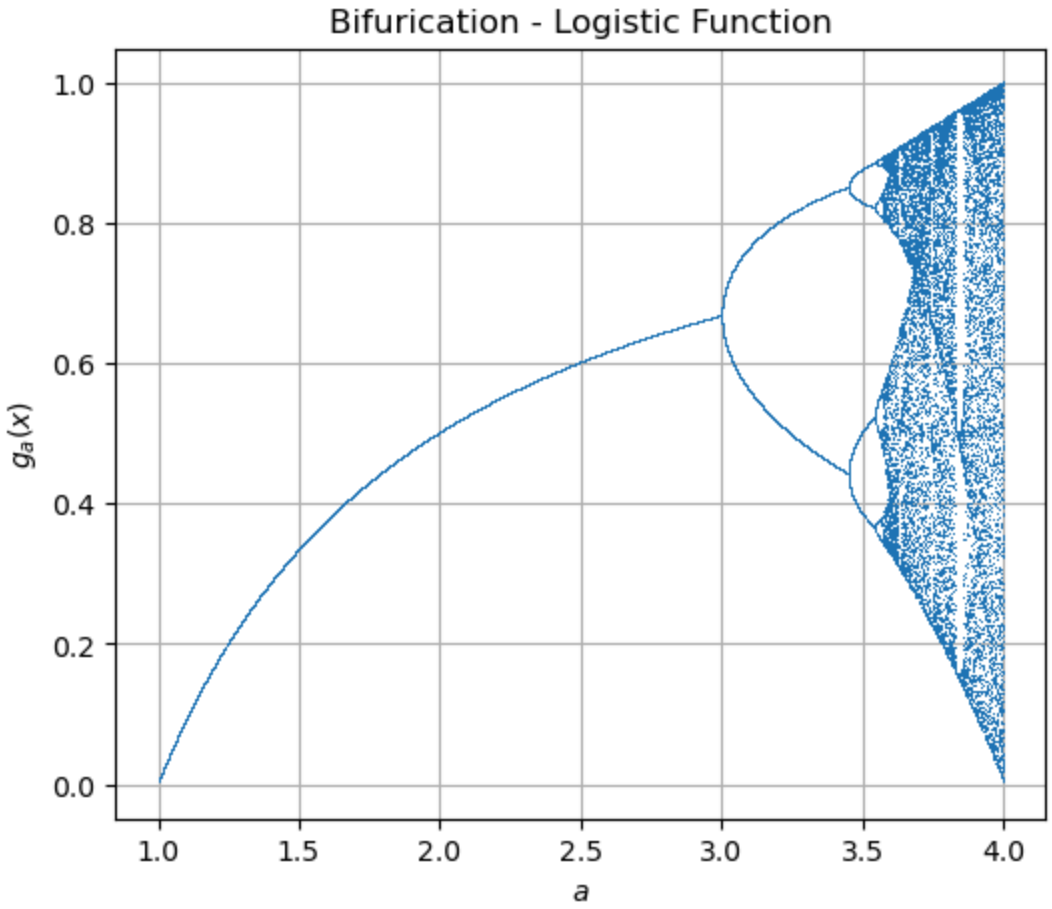
In [18]:
```
import matplotlib.pyplot as plt
import numpy as np
import random
```

In [24]:
```
def plot_bifurication(a_ranges, f, title, filename):
    fig, ax = plt.subplots(ncols=len(a_ranges), figsize=(6 * len(a_ranges),
    if len(a_ranges) == 1:
        ax = [ax]
    for axis, a_vals in zip(ax, a_ranges):
        x_vals = []
        for a in a_vals:
            x = random.random()
            for _ in range(int(1_000)):
                x = f(a, x)
            x_vals.append(x)
        axis.plot(a_vals, x_vals, ',')
        axis.set_xlabel('$a$')
        axis.set_ylabel('$g_a(x)$')
        axis.set_title('Bifurication - ' + title)
        axis.grid()

    plt.savefig(filename + '.png')

    return fig
```

In [25]:
```
a = plot_bifurication([np.linspace(1, 4, 100_000)], lambda a,x: a * x * (1 -
```



In [27]:
```
b = plot_bifurication([np.linspace(3.4, 4, 100_000), np.linspace(3.82, 3.86,
```