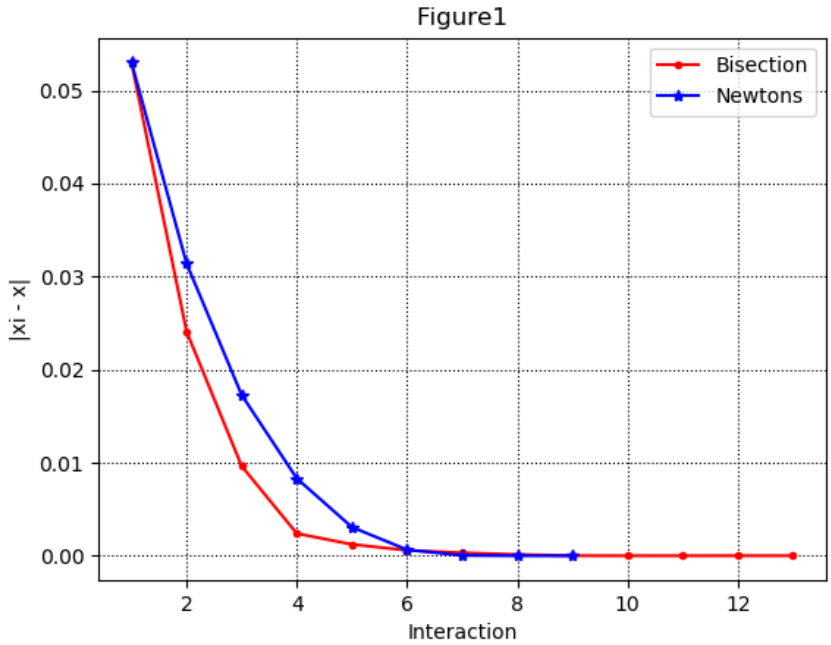
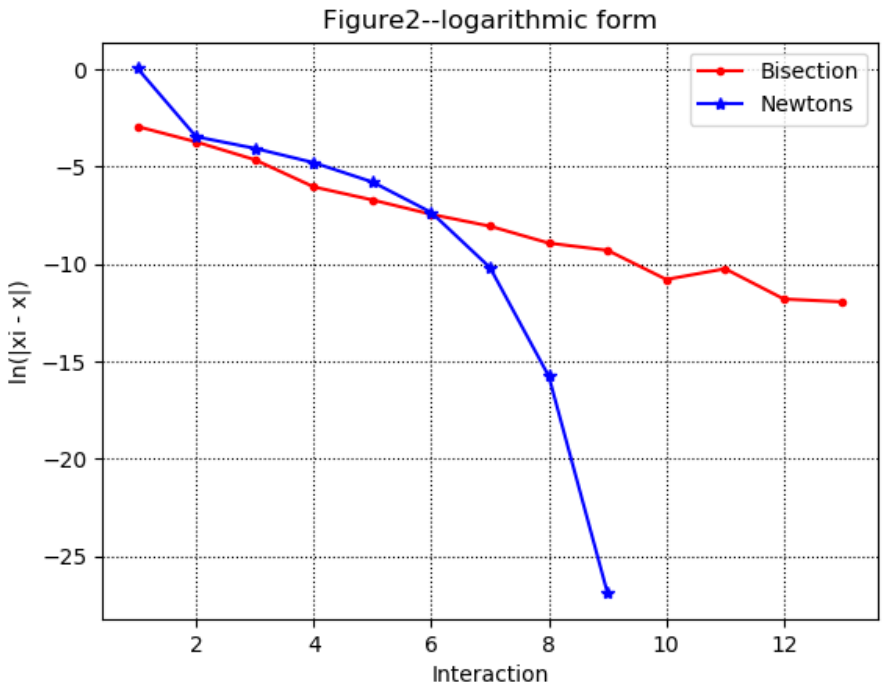
By using python's matplotlib and numpy, I got the following figures:




If we just look at Figure1, it seems that Bisection method approaches the root faster than Newton's at first. To make it clear, a different figure is made in logarithmic form:




Now, it is pretty obvious that Newton's method converges much faster, even faster than the logarithm while Bisection Method converges as fast as logarithm.

## Appendix:

#Draw.py for Figure 1:

```
import matplotlib.pyplot as plt
import numpy as np

file =
open("C://Users//18123//Desktop//Assignment3_YiminZhao_CentOS7.6//NewtonsMethod.txt")
NewtonsMethod = np.asfarray(file.read().split('\n'))
file1 =
open("C://Users//18123//Desktop//Assignment3_YiminZhao_CentOS7.6//bisection.txt")
Bisection = np.asfarray(file1.read().split('\n'))

iteration = np.array(range(1, len(Bisection)+1))
iteration_ = np.array(range(1, len(NewtonsMethod)+1))

plt.plot(iteration, Bisection, color="red", marker = '.', label='Bisection')
plt.plot(iteration_, NewtonsMethod, color='blue', marker = '*',label='Newtons')
plt.xlabel("Interaction")
plt.ylabel("|xi - x|")
plt.title("Figure1")
plt.grid(color="k", linestyle=":")
plt.legend()
plt.show()
```

#Draw_L.py for Figure 2:

```
import matplotlib.pyplot as plt
import numpy as np

file =
open("C://Users//18123//Desktop//Assignment3_YiminZhao_CentOS7.6//NewtonsMethod_L.txt")
NewtonsMethod = np.asfarray(file.read().split('\n'))
file1 =
open("C://Users//18123//Desktop//Assignment3_YiminZhao_CentOS7.6//bisection_L.txt")
Bisection = np.asfarray(file1.read().split('\n'))

iteration = np.array(range(1, len(Bisection)+1))
iteration_ = np.array(range(1, len(NewtonsMethod)+1))

plt.plot(iteration, Bisection, color="red", marker = '.', label='Bisection')
```

```
plt.plot(iteration_, NewtonsMethod, color='blue', marker = '*',label='Newtons')
plt.xlabel("Interaction")
plt.ylabel("ln(|xi - x|)")
plt.title("Figure2–logarithmic form")
plt.grid(color="k", linestyle=":")
plt.legend()
plt.show()
```