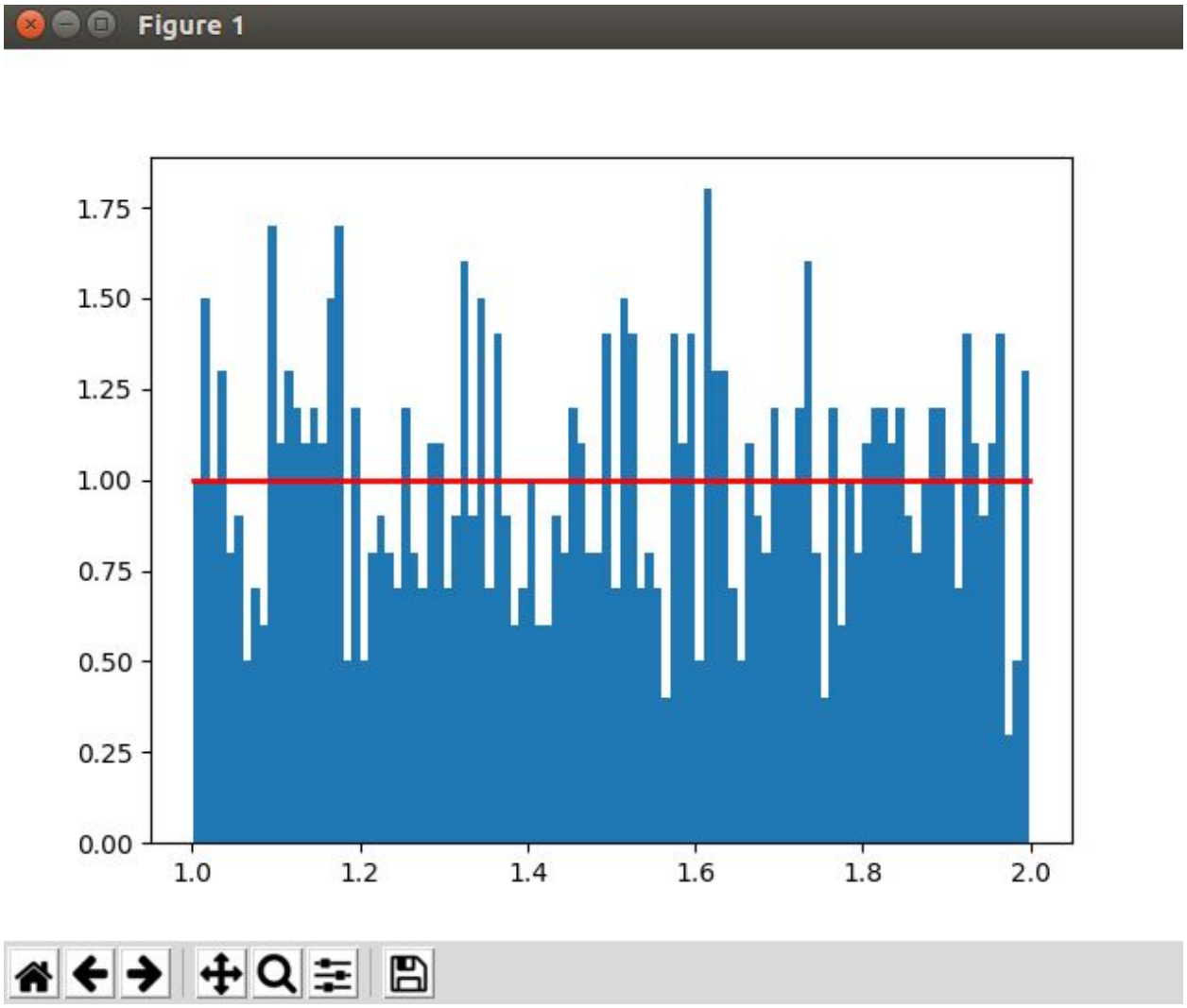
Solution for Assign 1 by Abhay Pratap Singh (TCS15B002)

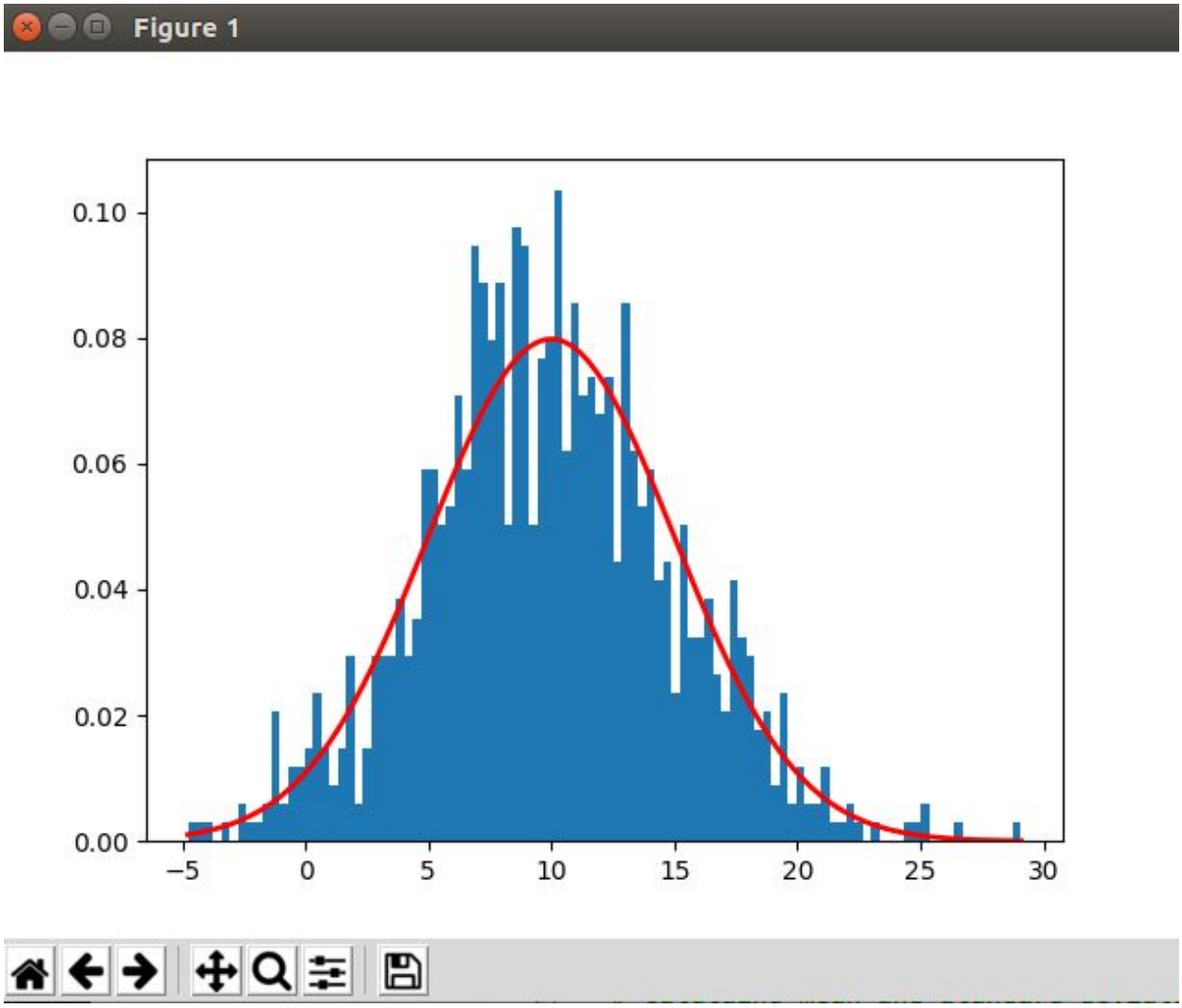
Sol 1-a:

```
alpha@Alpha:~/Labwork$ python /home/alpha/Labwork/ML/part1.py
Mean for uniform distribution: 1.4993382765
Standard Deviation for uniform distribution: 0.291010250268
```



Sol 1-b:

```
Mean for normal distribution: 9.92997239817
Standard Deviation for normal distribution: 5.04885782614
alpha@Alpha:~/Labwork$
```



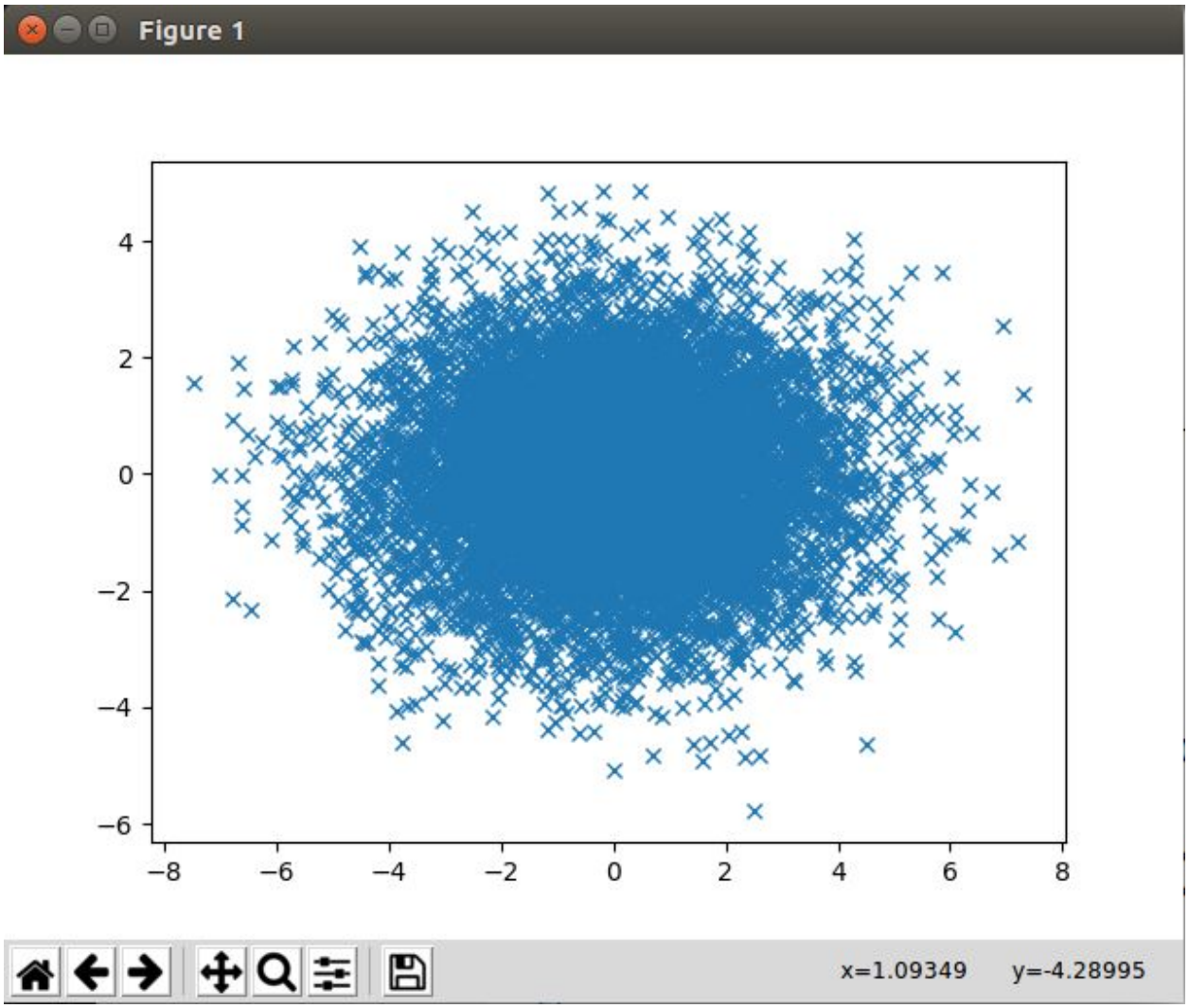
Sol 2:

I have attached the plots for both 1-a and 1-b above.
I have made histograms and will use squared mean error to get a approximate hold on the distribution.

Sol 3:

Case 1:

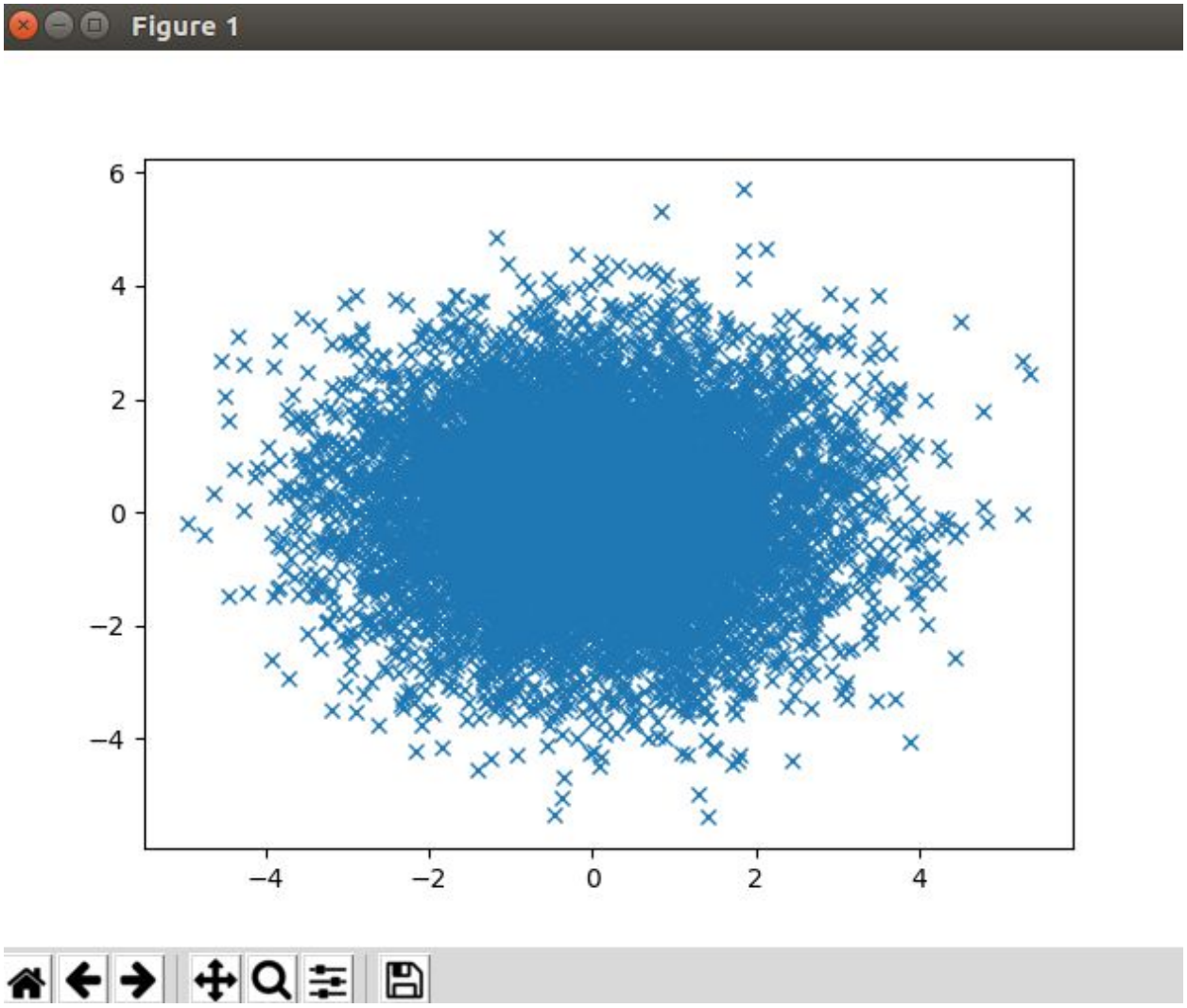
Variation along x-axis is more than y-axis therefore we have obtained a ellipse with major axis parallel to x-axis.




```
alpha@Alpha:~/Labwork$ python /home/alpha/Labwork/ML/part3.py
mean: [-0.0067445243744174224, -0.015276885073511952]
cov matrix:[[3.9014217745879098, 0.012139664548287419], [0.012139664548287419, 1.9762207699911769]]
```

Case 2:

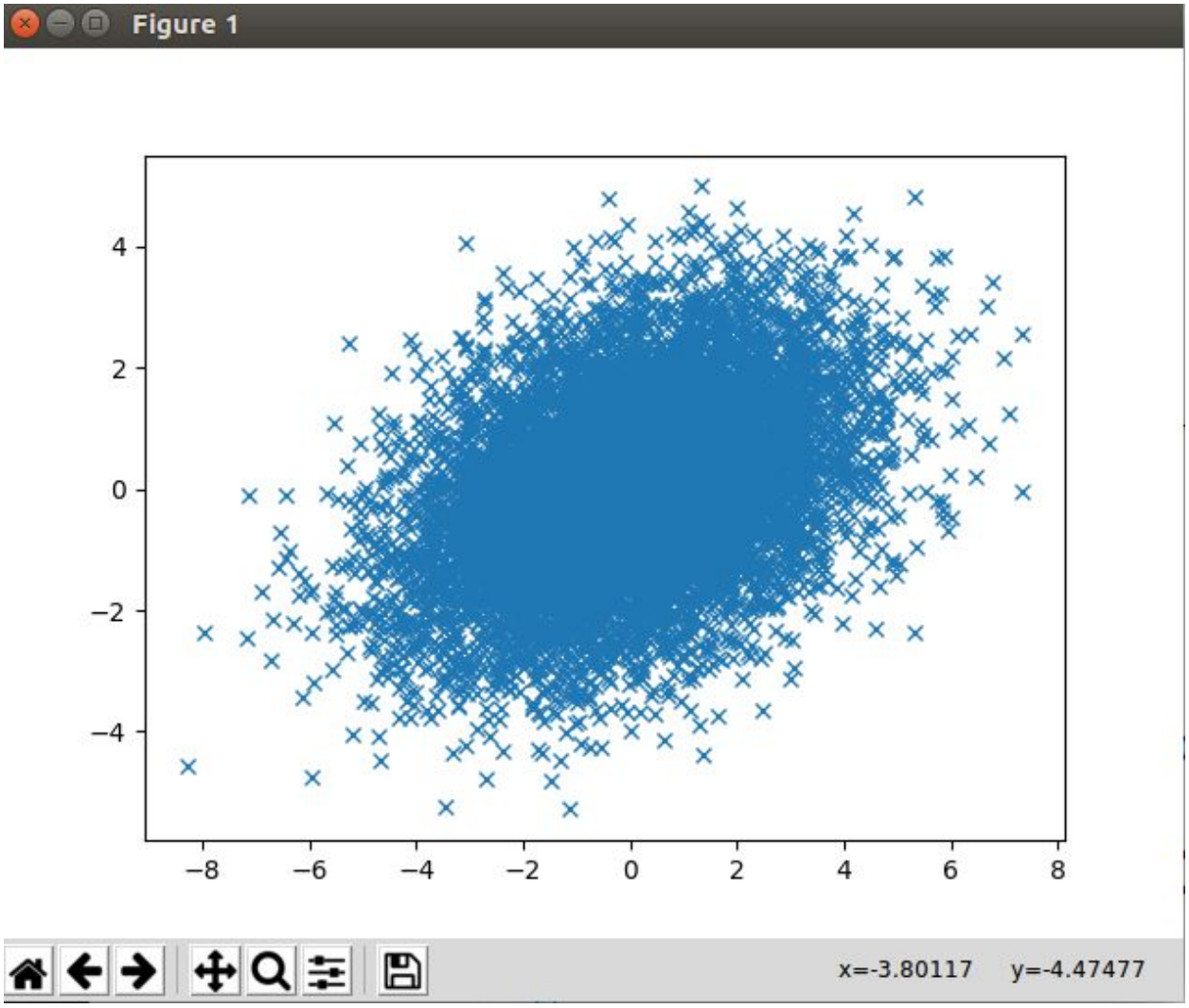
In this case both variance along x and y axis are equal therefore we obtain a circular plot.




```
mean: [-6.2617966831891132e-05, 0.027926080438471161]
cov matrix:[[2.011374472422812, -0.010787659824364911], [-0.010787659824364911, 2.0185006110764463]]
```

Case 3:

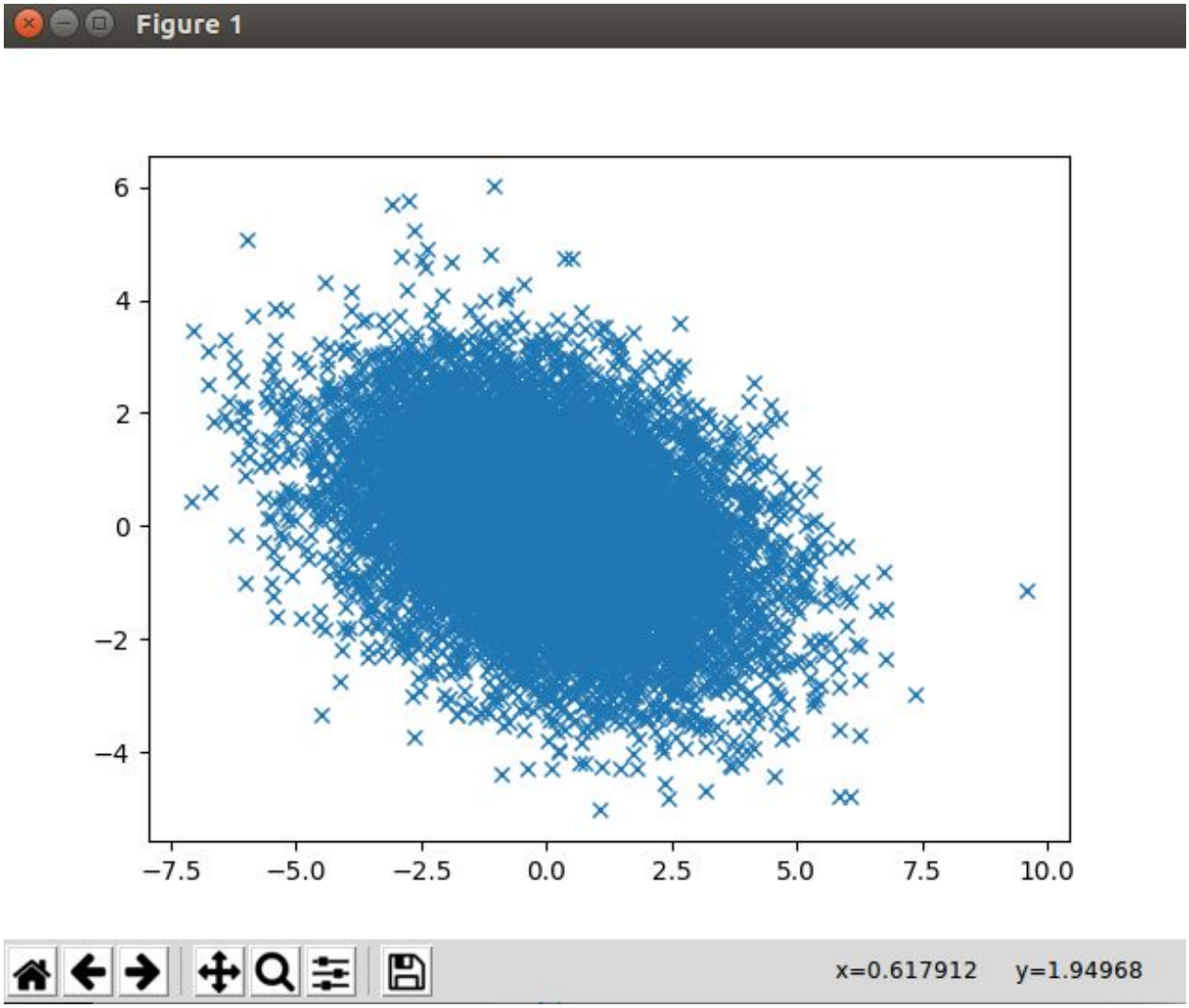
For the convenience of observation I have doubled the variance along x-axis.
As the covariance along the axis is 1 we get a ellipse with major axis parallel to the line y=x




```
mean: [-0.011026584021235259, 0.0086874147520253093]
cov matrix:[[3.9514344121016252, 1.0480541795350689], [1.0480541795350689, 2.0206623327563777]]
```

Case 4:

For the convenience of observation I have doubled the variance along x-axis.
As the covariance along the axis is 1 we get a ellipse with major axis parallel to the line y=-x




```
mean: [-0.016009946969683813, -0.0068896905058834319]
cov matrix:[[3.9694308236635543, -0.98871176714718756], [-0.98871176714718756, 1.9757179974953913]]
alpha@Alpha:~/Labwork$
```