Monte Carlo Simulation Assignment 10

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Question 1-
Taking
S(0)=100

```
u=0.2
sig=0.1
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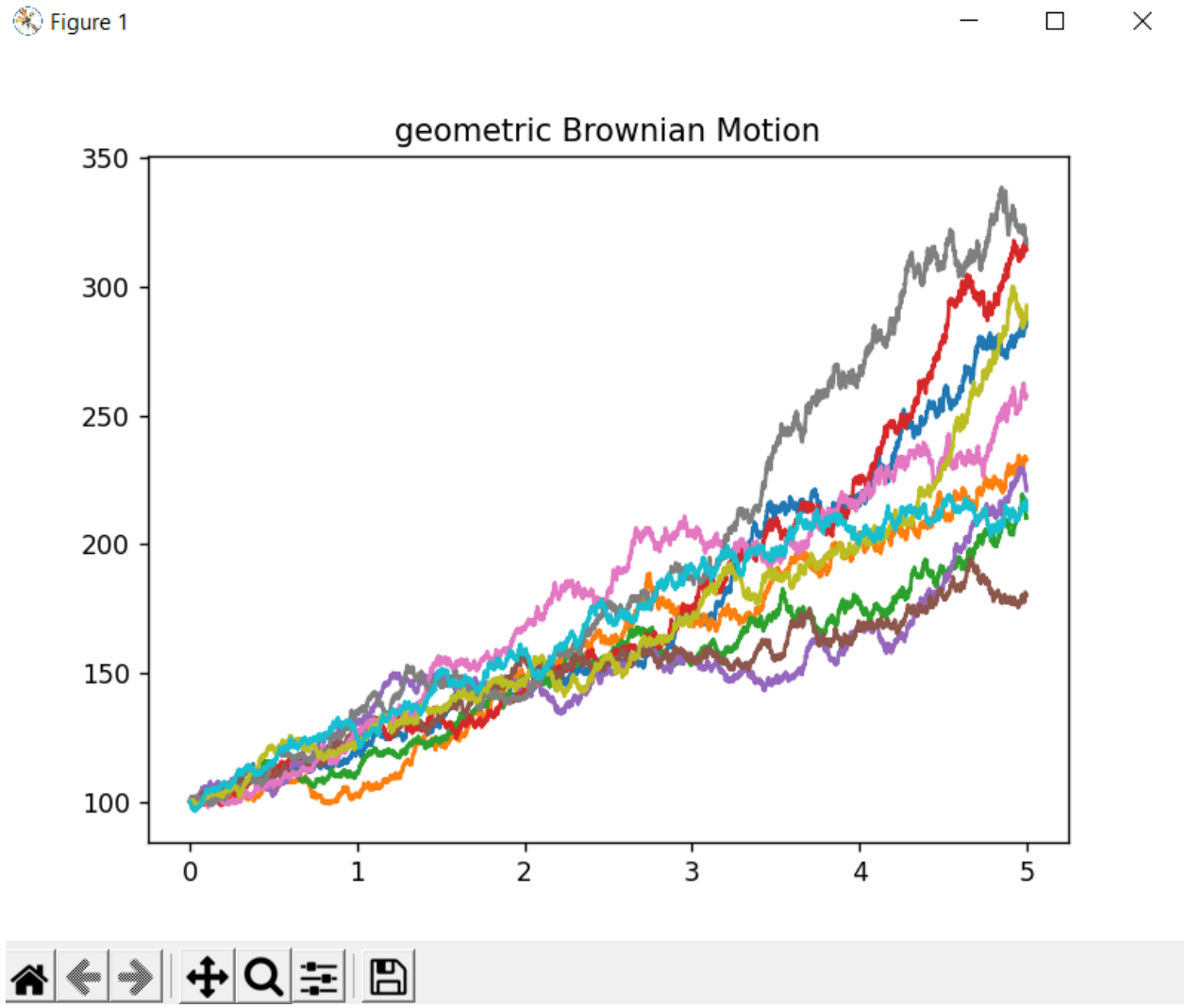
Geometric Brownian Motion

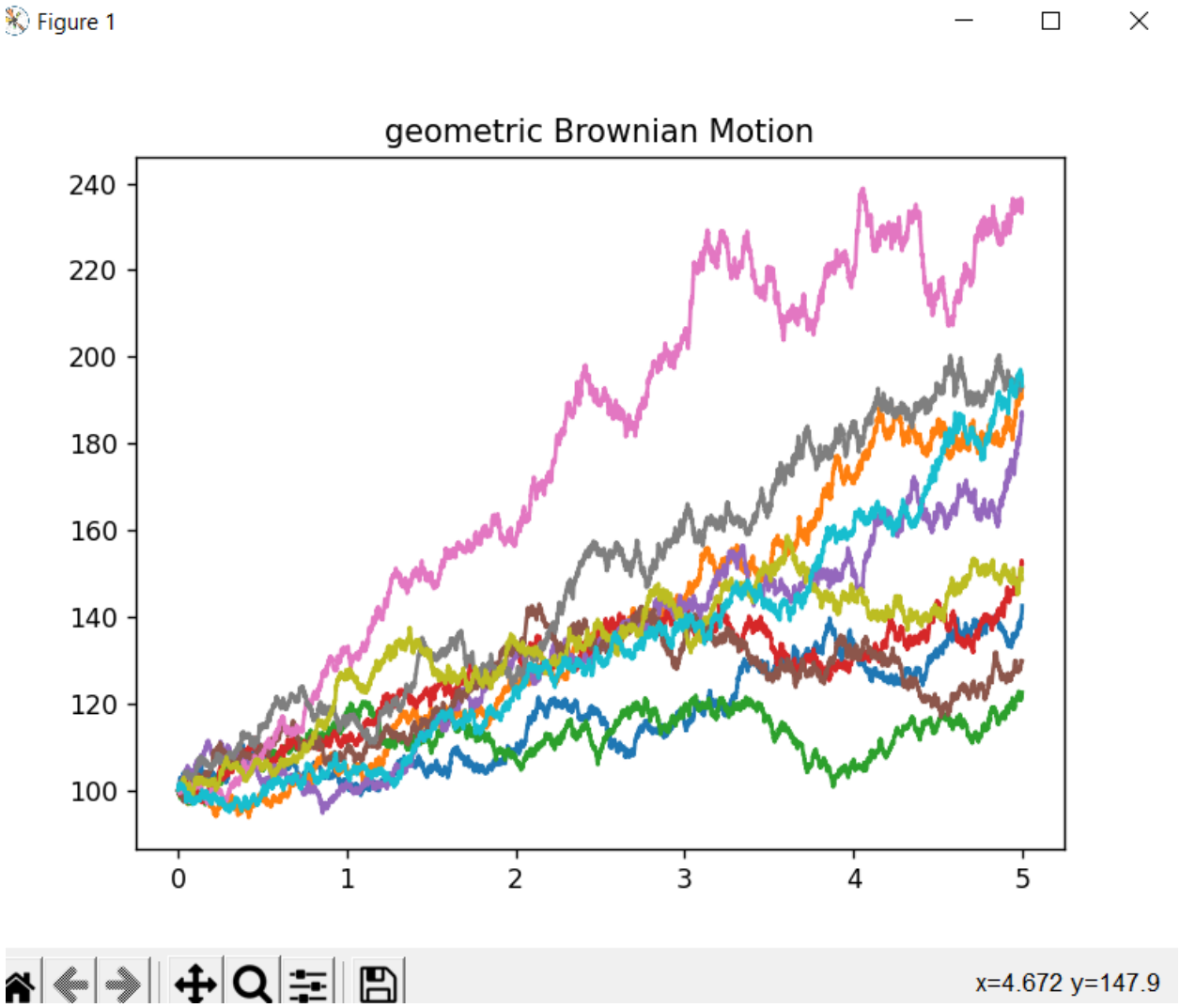


Simulated value of E[S[5]] = 252.64068789386798
Actual value of E[S[5]] = 271.8281828459045

Var(S(T)) = S0*S0* e^2μT*(e^(σ^2*T) − 1).

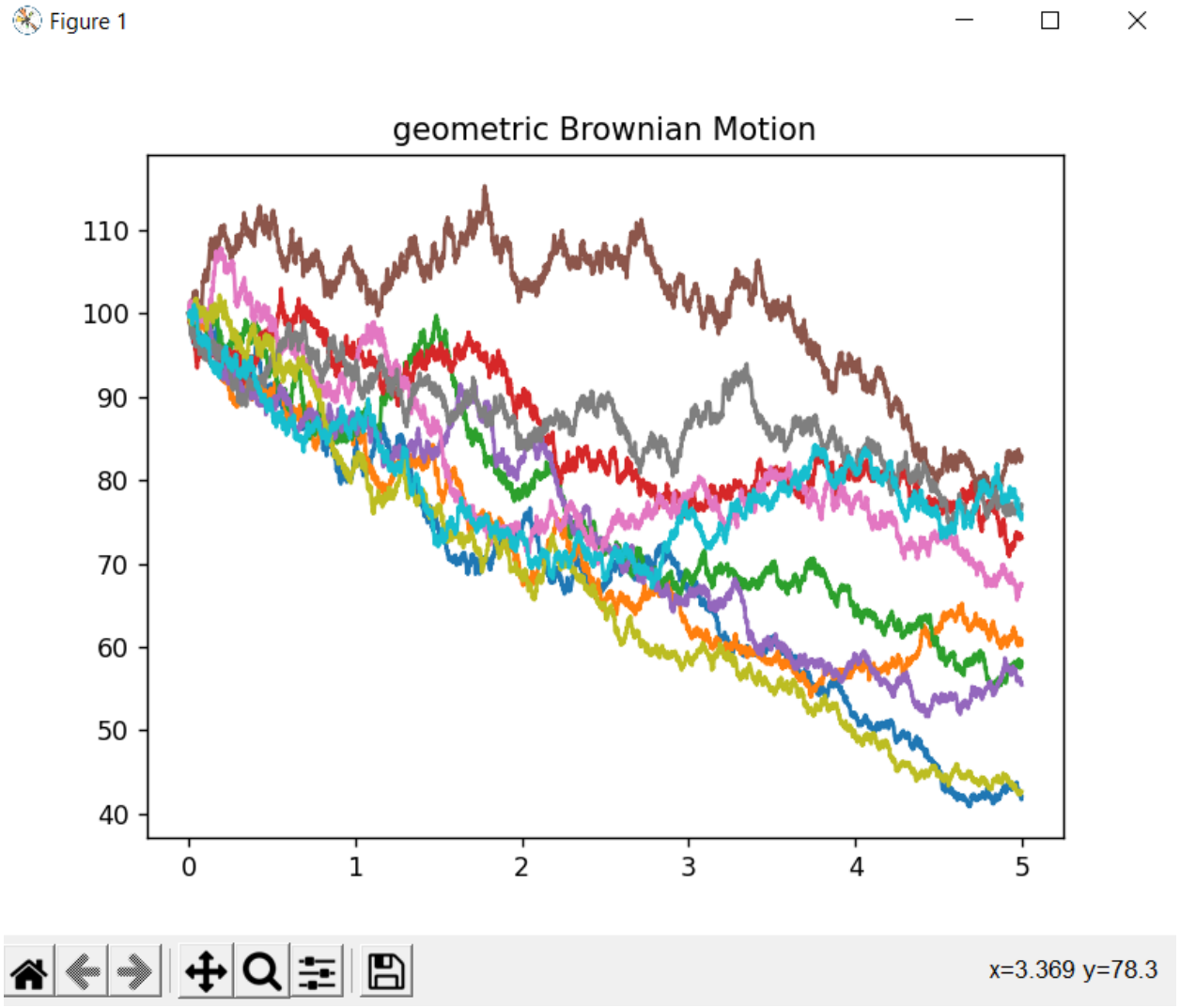
Simulated value of Var[S[5]] = 2075.8807193528783
Actual value of Var[S[5]] = 3788.450073761221

```
u=0.1
sig=0.1
```



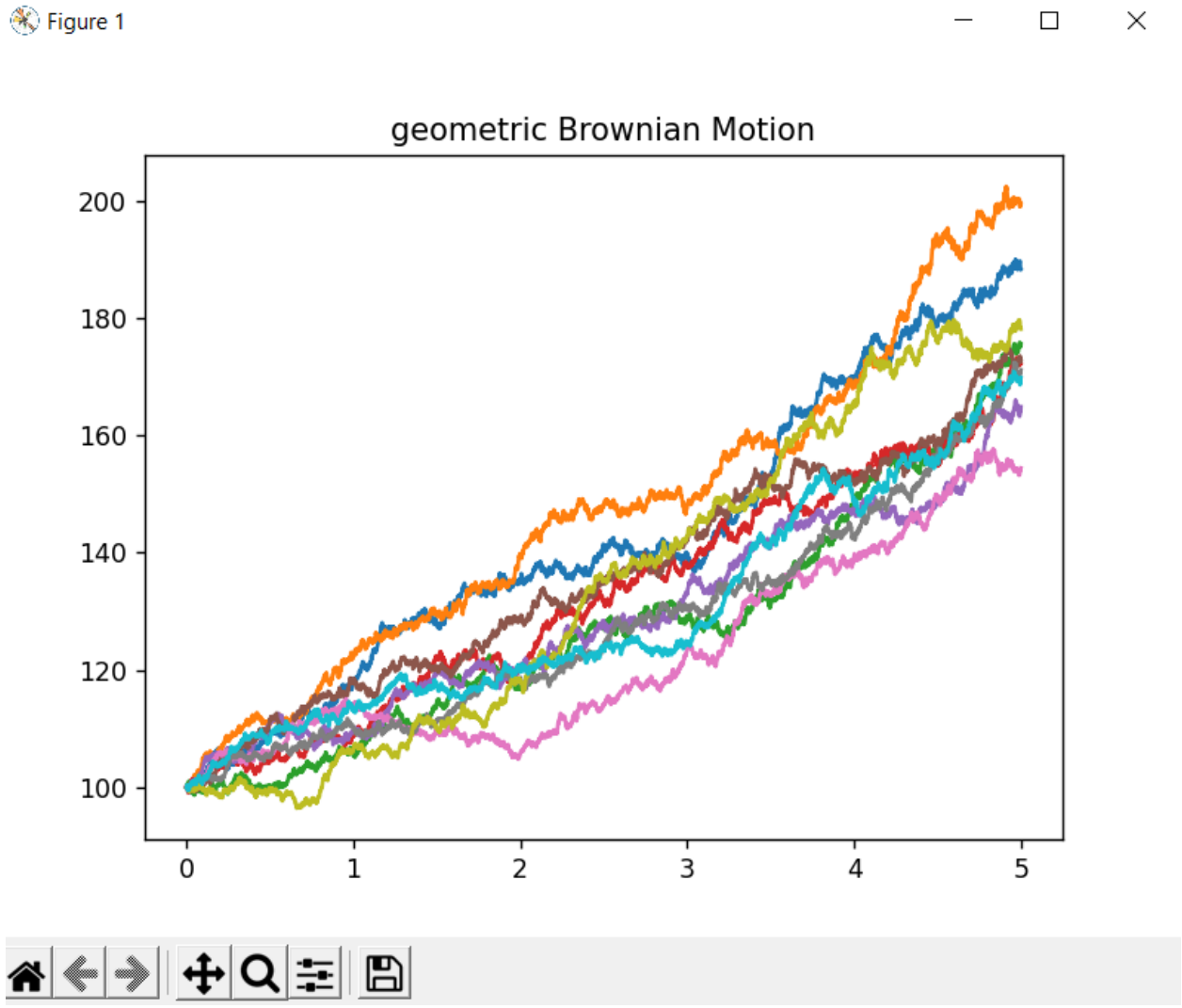
Simulated value of E[S[5]] = 169.69598720203587
Actual value of E[S[5]] = 164.87212707001282
Simulated value of Var[S[5]] = 1155.2769578552195
Actual value of Var[S[5]] = 1393.6928960411876

● u= -0.1 and sigma =0.1



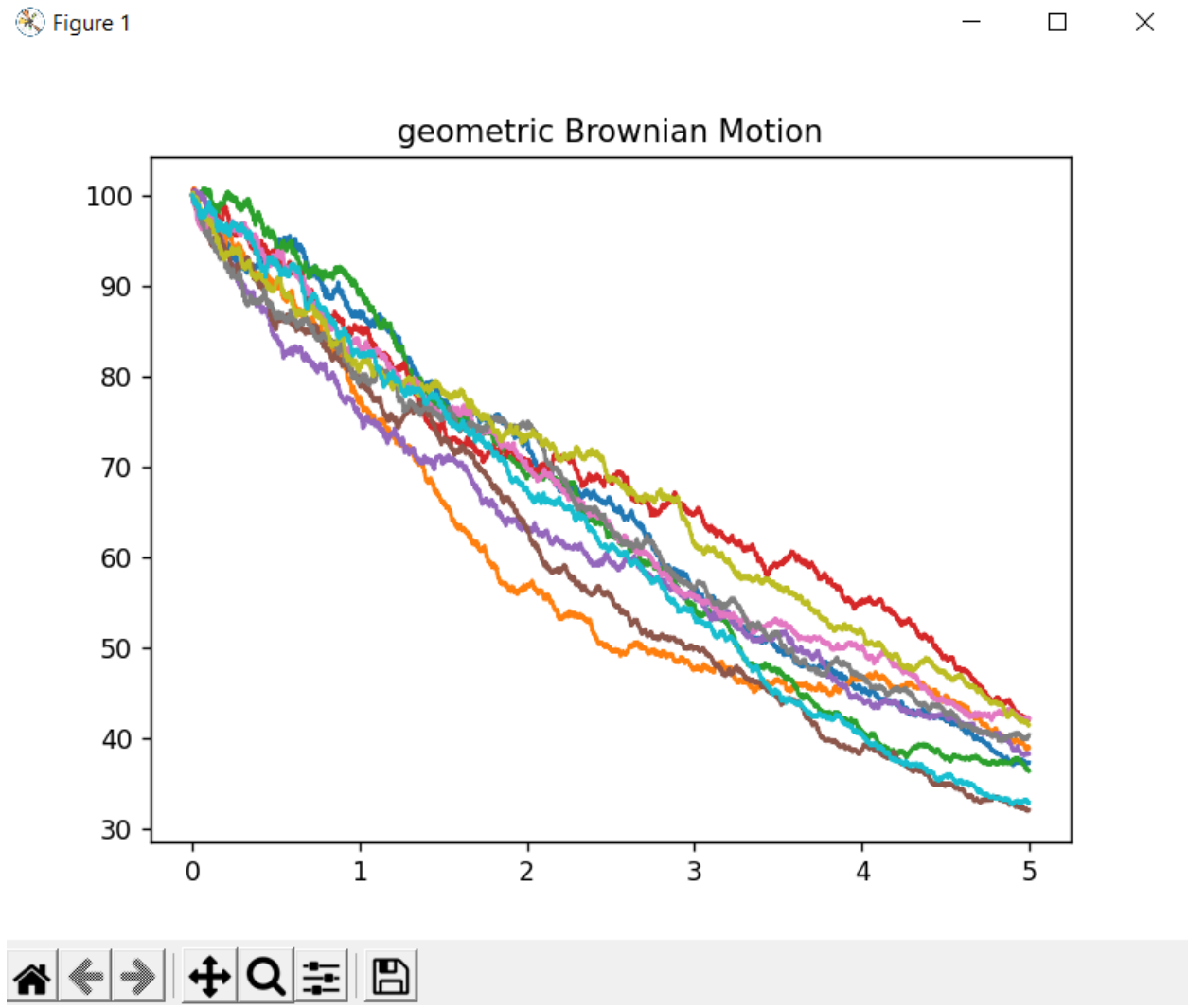
Simulated value of E[S[5]] = 63.50293831736077
Actual value of E[S[5]] = 60.653065971263345
Simulated value of Var[S[5]] = 180.7219134260336
Actual value of Var[S[5]] = 188.61582283058914

```
u=0.1
sig=0.05
```



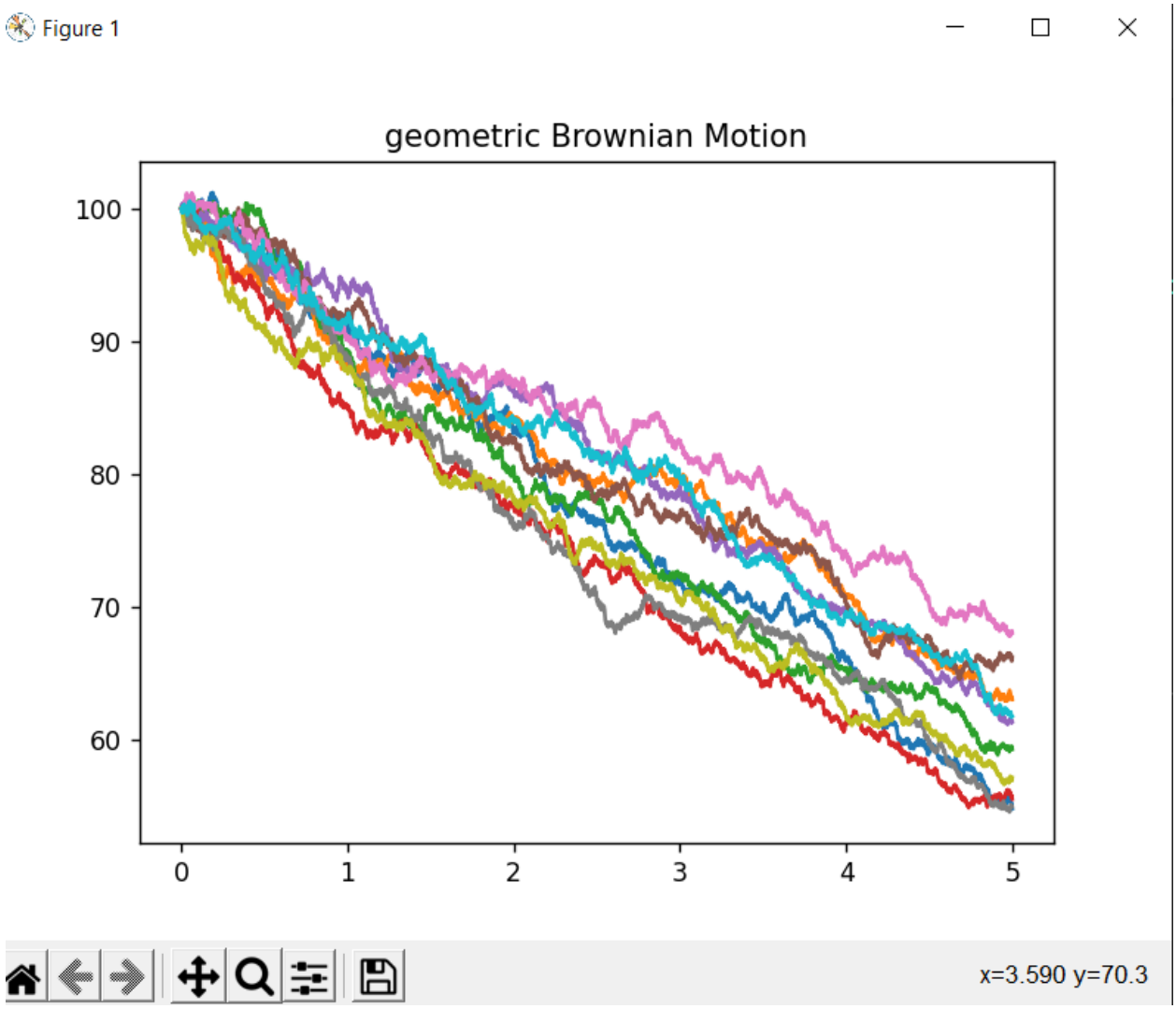
Simulated value of E[S[5]] = 174.72815165866547
Actual value of E[S[5]] = 164.87212707001282
Simulated value of Var[S[5]] = 136.4782862979858
Actual value of Var[S[5]] = 341.91776253059214

```
u=-0.2
sig=0.05
```



Simulated value of E[S[5]] = 38.177360186340955
Actual value of E[S[5]] = 36.787944117144235
Simulated value of Var[S[5]] = 11.737062356964632
Actual value of Var[S[5]] = 17.023083019297662

u= -0.1 and sigma =0.04



Simulated value of E[S[5]] = 60.23280066410465
Actual value of E[S[5]] = 60.653065971263345
Simulated value of Var[S[5]] = 19.84377911689039
Actual value of Var[S[5]] = 29.5483912675337