

GibbsExample

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[1]: import numpy as np
import matplotlib.pyplot as plt
rng = np.random.default_rng()
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[2]: # random numbers exponentially distributed between 0 and xmax, with a given rate
# this defines the conditionals in the Casella and George example

def erng(B,rate):
    return ( -np.log( 1- (1-np.exp(-rate*B) ) *rng.random() ) /rate )
```

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[6]: # Gibbs sampler

n=100000
B=3

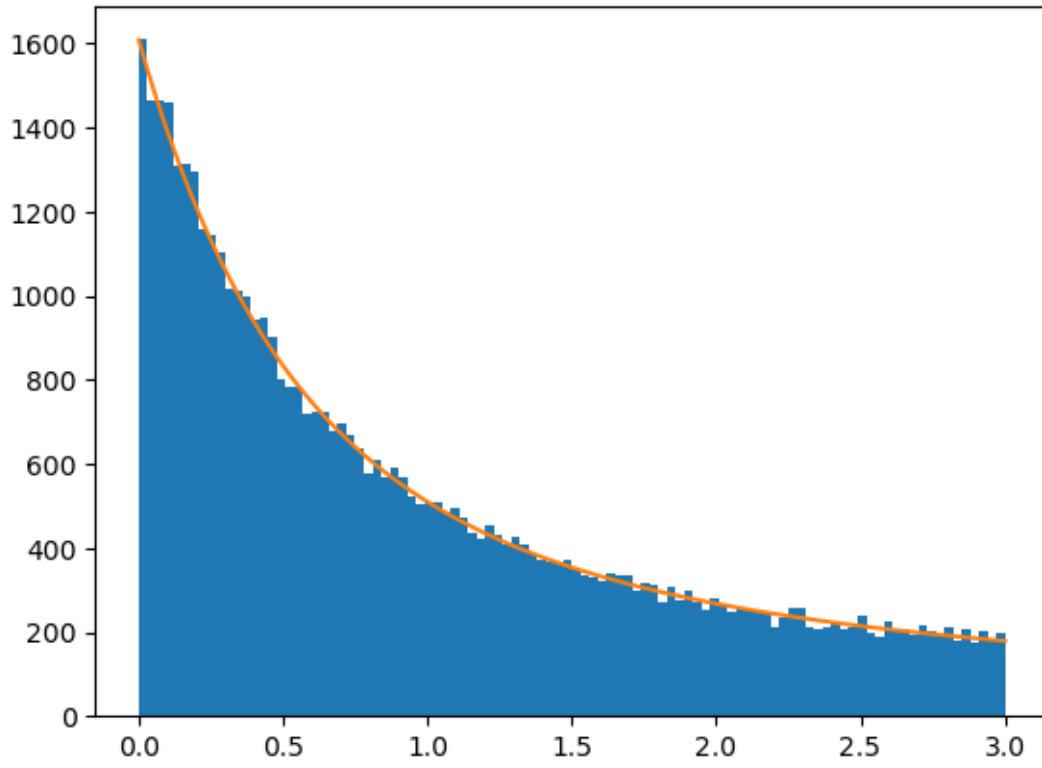
x=np.zeros(n)
y=np.zeros(n)

y[0]=2.

for i in range(0,n-1):
    x[i]=erng(B,y[i])
    y[i+1]=erng(B,x[i])
```

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[37]: # final histogram for x and comparison with analytical pdf

xc=np.linspace(0.001,B,100)
yc=(1-np.exp(-B*xc))/xc
norm=yc.sum()
yc=yc/norm
plt.hist(x[int(n/2):n],100)
plt.plot(xc,0.5*n*yc)
plt.show()
```



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