Markov Chain Monte Carlo algorithm

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R Markdown for Part A Sample Mean and Deviation and Part B Chain Values

Description of Markov Chain Monte Carlo Algorithm

The purpose of this algorithm is to generate and simulate random numbers generated in the distribution theory for the probability density function given. The answers for Parts A and B are given in this 1-page report. The histograms and KDEs and the plot of bR over a grid of s-values are shown in R markdown and Python which indicate the graphs in both coding files are generally consistent in shapes.

Part A

Sample Mean: (R markdown)	0.02920703
Sample Standard Deviation: (R markdown)	1.262088

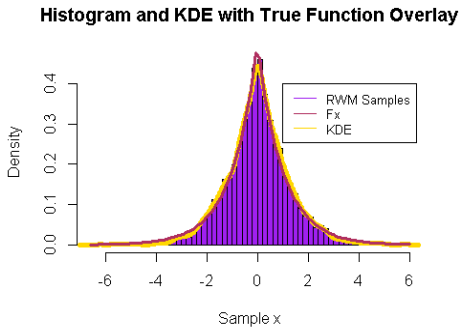

Fig.1.1: Histogram and KDE in R markdown

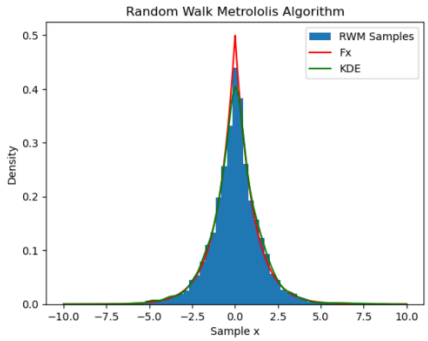

Fig.1.2: Histogram and KDE in Jupyter Python

Part B (Chain, Initial Value, Mj and Vj derived from R markdown codes)

Chain Number	Initial Value	Sample Mean Mj	Within Sample Variance Vj
Chain 1	-1.36	-29.86	485.46
Chain 2	-0.25	-35.97	670.03
Chain 3	0.49	-17.69	231.78
Chain 4	0.43	10.64	780.27

Overall Within Sample Variance (W): (R markdown)	541.88
Overall Sample Mean (M): (R markdown)	-18.22
Overall Between Sample Variance (B): (R markdown)	320.97
Convergence diagnostics R Value: (R markdown)	1.26

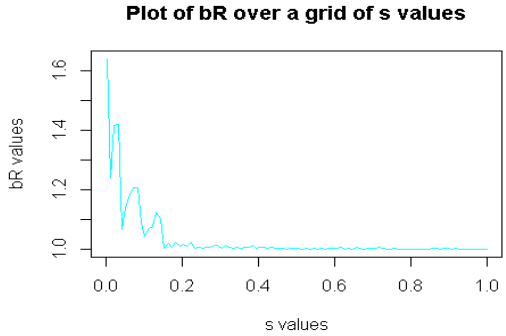

Fig.1.3: Plot of bR graph in R markdown

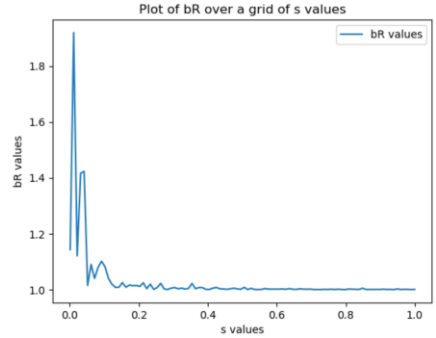

Fig.1.4: Plot of bR graph in Jupyter Python