CS-419 ASSIGNMENT-1
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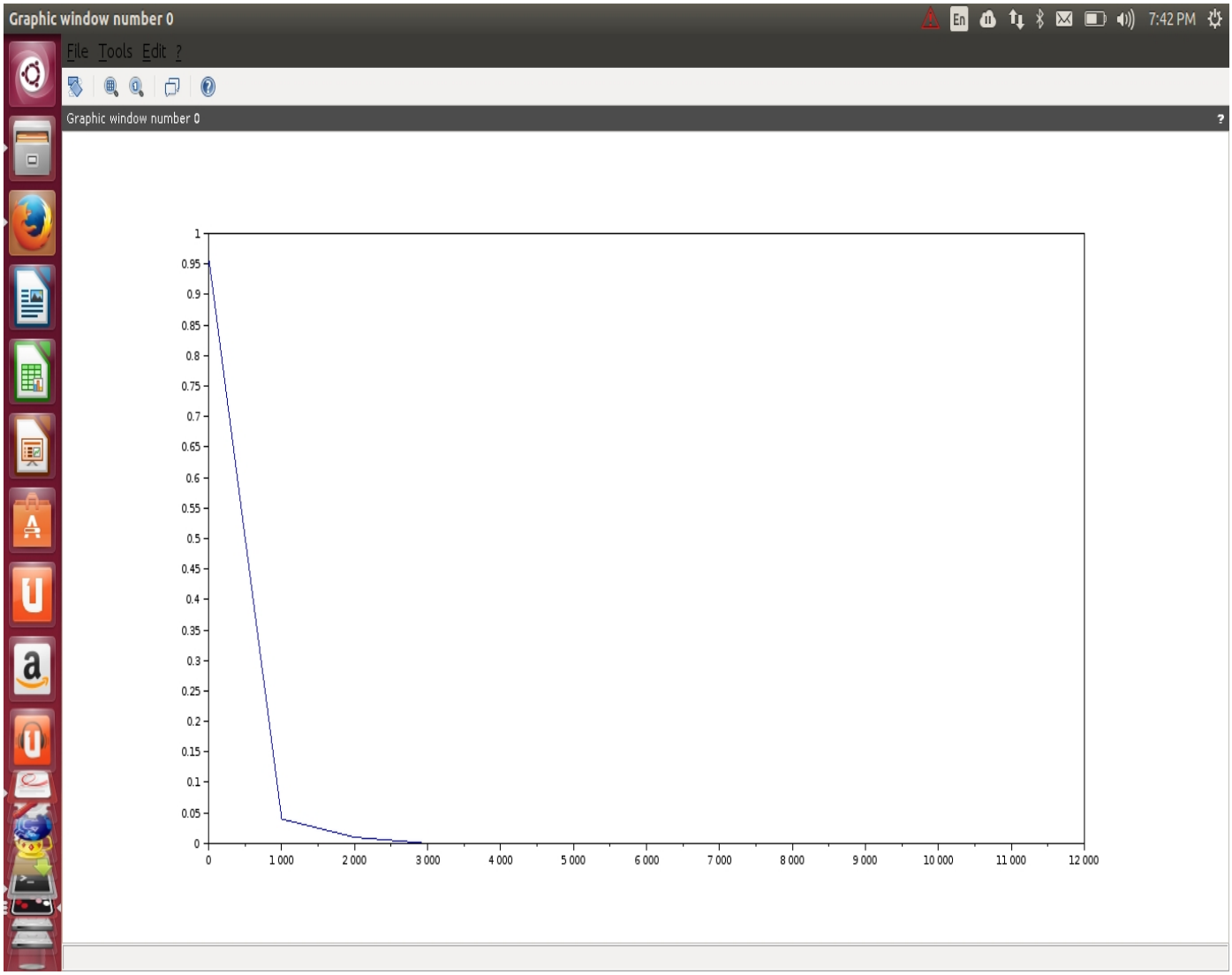
(kindly see the file in 100% so as to see images clearly)

1)

plots of Fraction vs m(1000 2000 3000...10000) p=100

The delieverables of mean and covarianace matrix have not been given for large n:-
Plot-1
N=1;

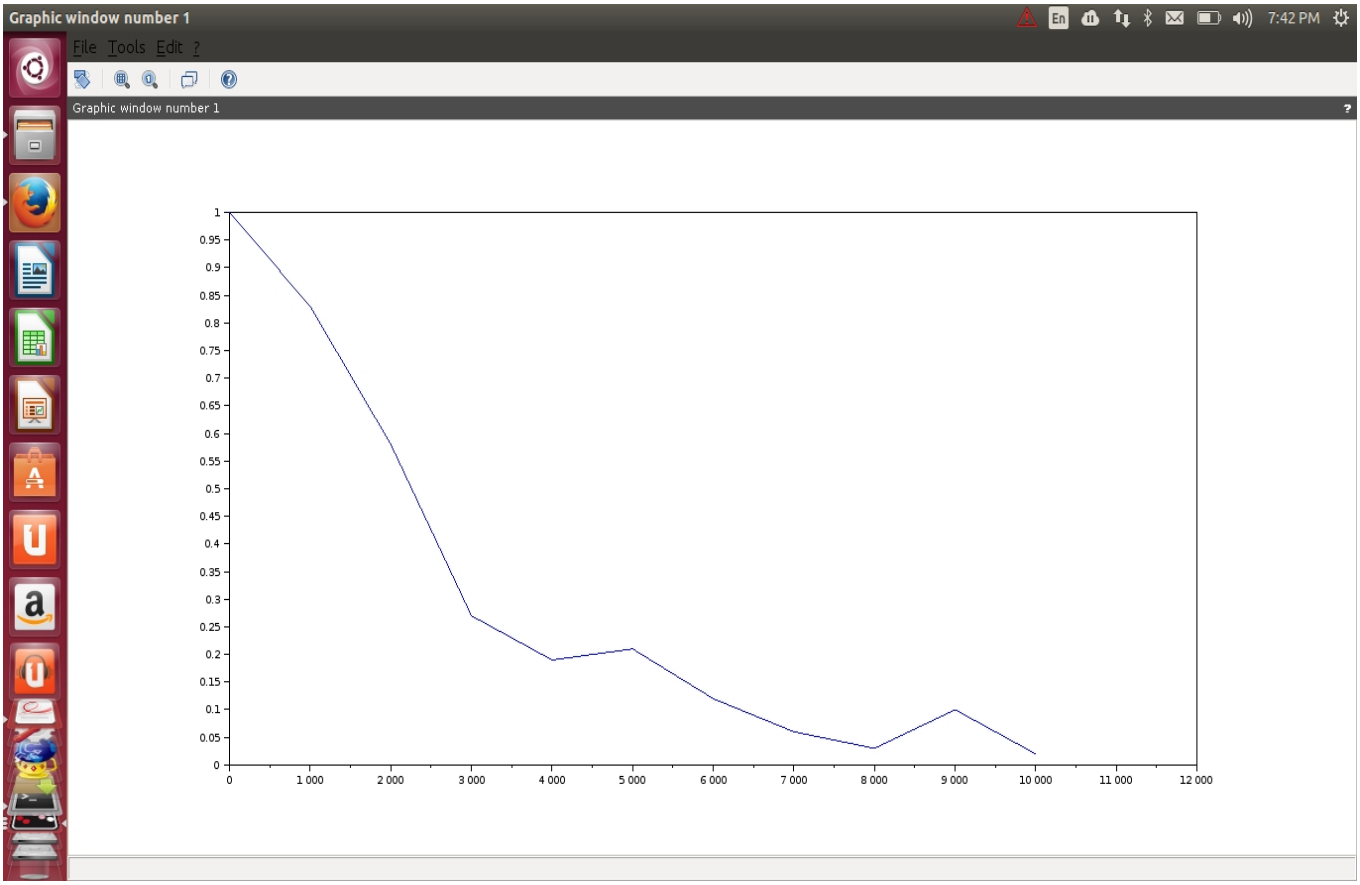


mean:
0.8497452
0.6857310

Covariance matrix:

0.7759392 0.5378345
0.5378345 0.7532679

Plot-2
N=5;



mean vector:

0.2615761
0.4993494
0.2638578
0.5253563
0.5376230
0.1199926

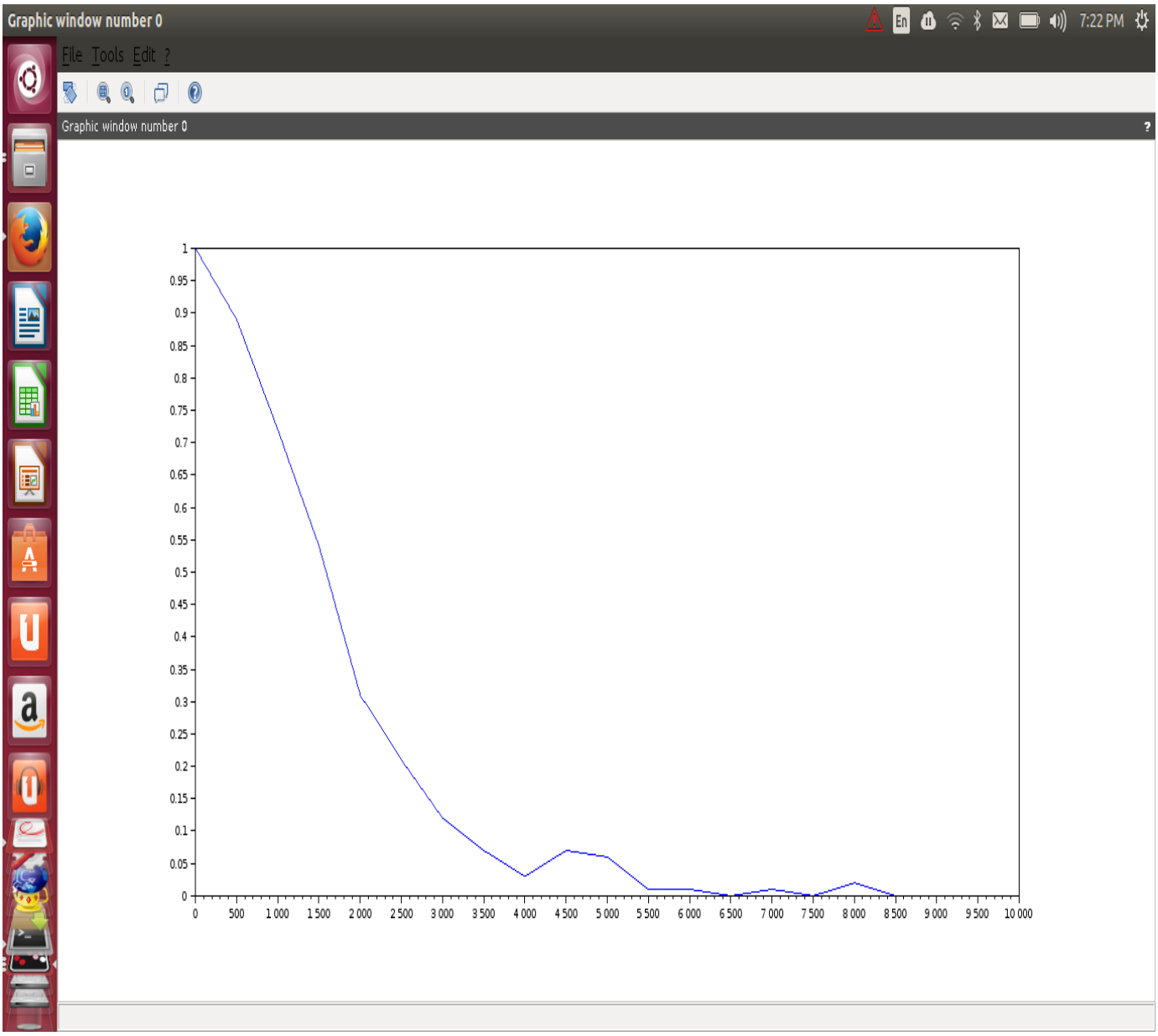
covariance matrix:

1.5185966 1.399351 1.4563124
1.399351 2.1763656 2.1520774
1.4563124 2.1520774 2.8211222
1.2421034 2.0711602 1.8605152
1.4042609 1.9279236 2.4859325
1.1951078 1.1432052 1.3510546

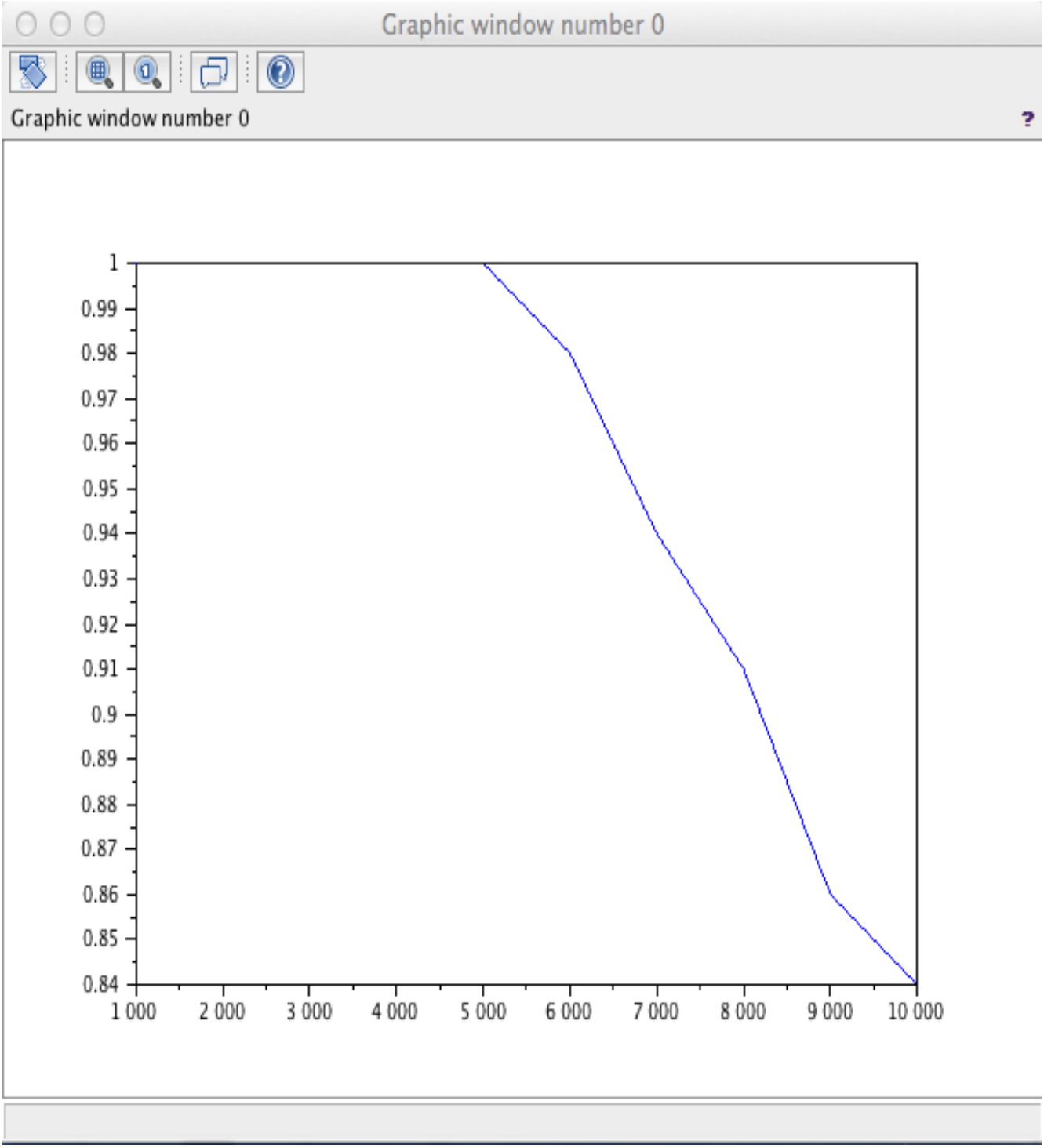
1.2421034 1.4042609 1.1951078
2.0711602 1.9279236 1.1432052
1.8605152 2.4859325 1.3510546
2.5071916 1.9330429 1.1691253
1.9330429 2.9249086 1.8453569
1.1691253 1.8453569 1.5994395

Plot 3-

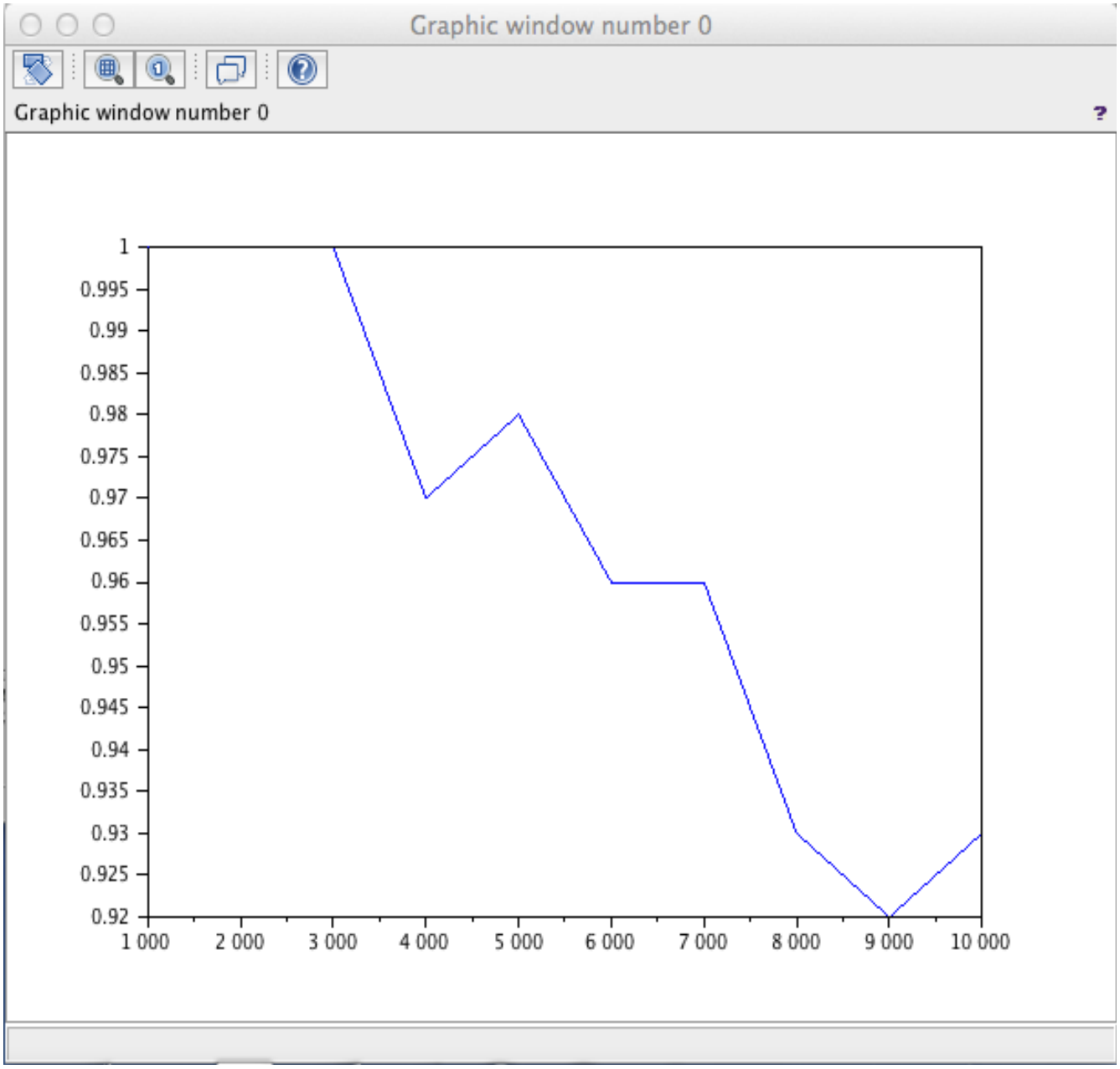
N=10


Graphic window number 0
File Tools Edit ?
Graphic window number 0
7:22 PM
1
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0 500 1 000 1 500 2 000 2 500 3 000 3 500 4 000 4 500 5 000 5 500 6 000 6 500 7 000 7 500 8 000 8 500 9 000 9 500 10 000

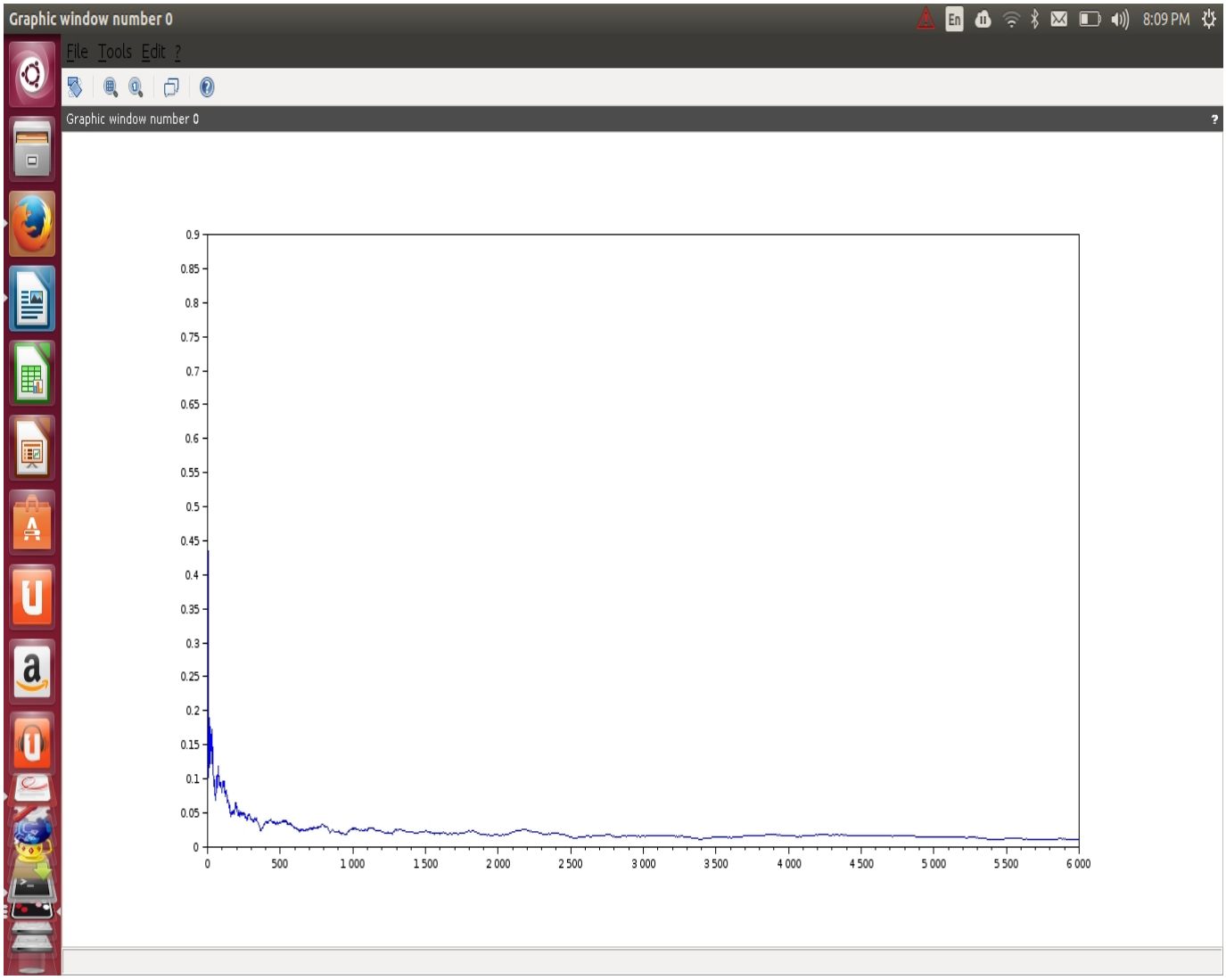
Plot-4
N=50


Graphic window number 0
Graphic window number 0
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.86
0.85
0.84
1 000
2 000
3 000
4 000
5 000
6 000
7 000
8 000
9 000
10 000

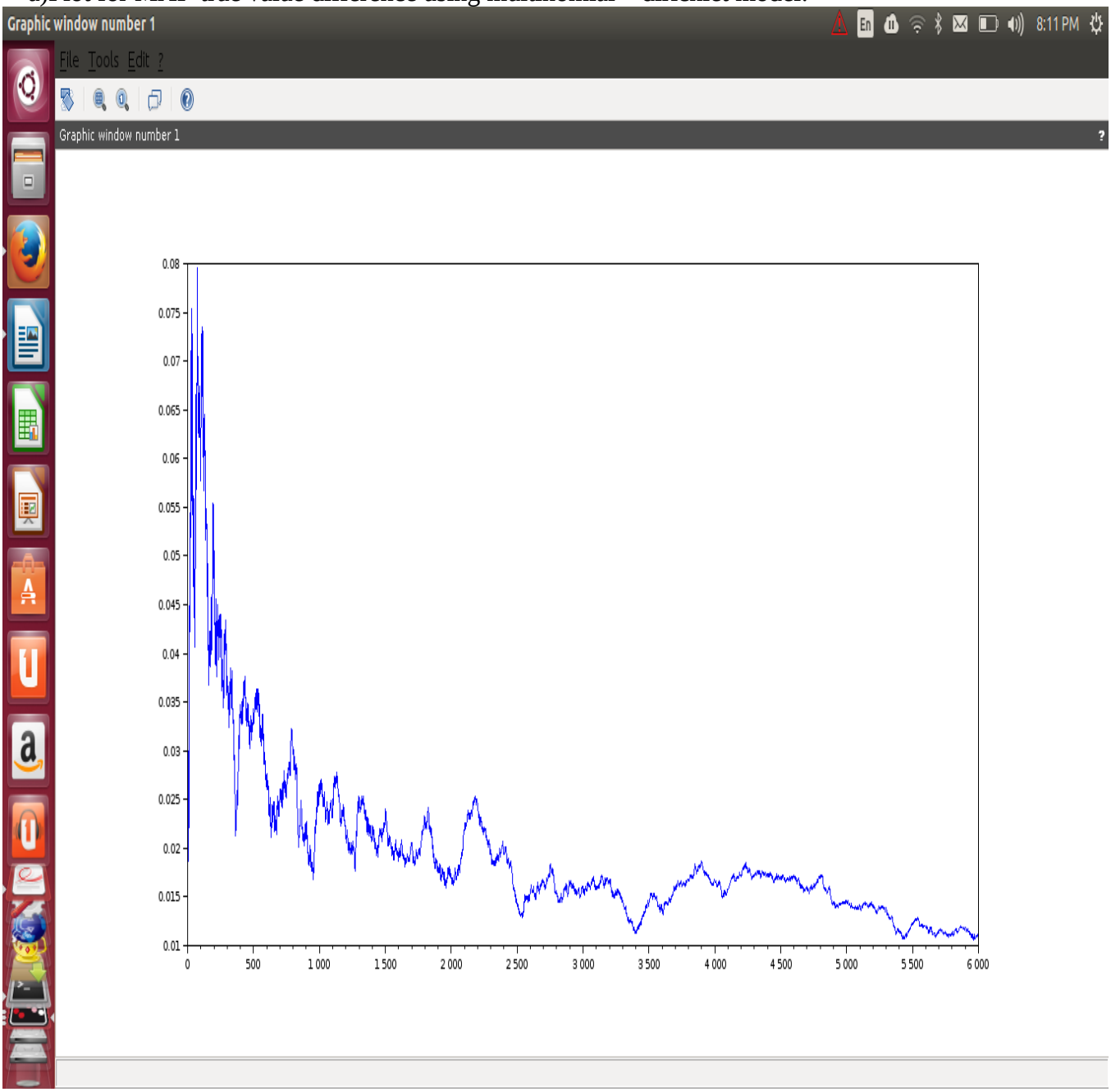
Plot 5-
N=100


Graphic window number 0
Graphic window number 0
1
0.995
0.99
0.985
0.98
0.975
0.97
0.965
0.96
0.955
0.95
0.945
0.94
0.935
0.93
0.925
0.92
1 000
2 000
3 000
4 000
5 000
6 000
7 000
8 000
9 000
10 000

2)
i)Difference between true estimates and MLE:
Plot:1

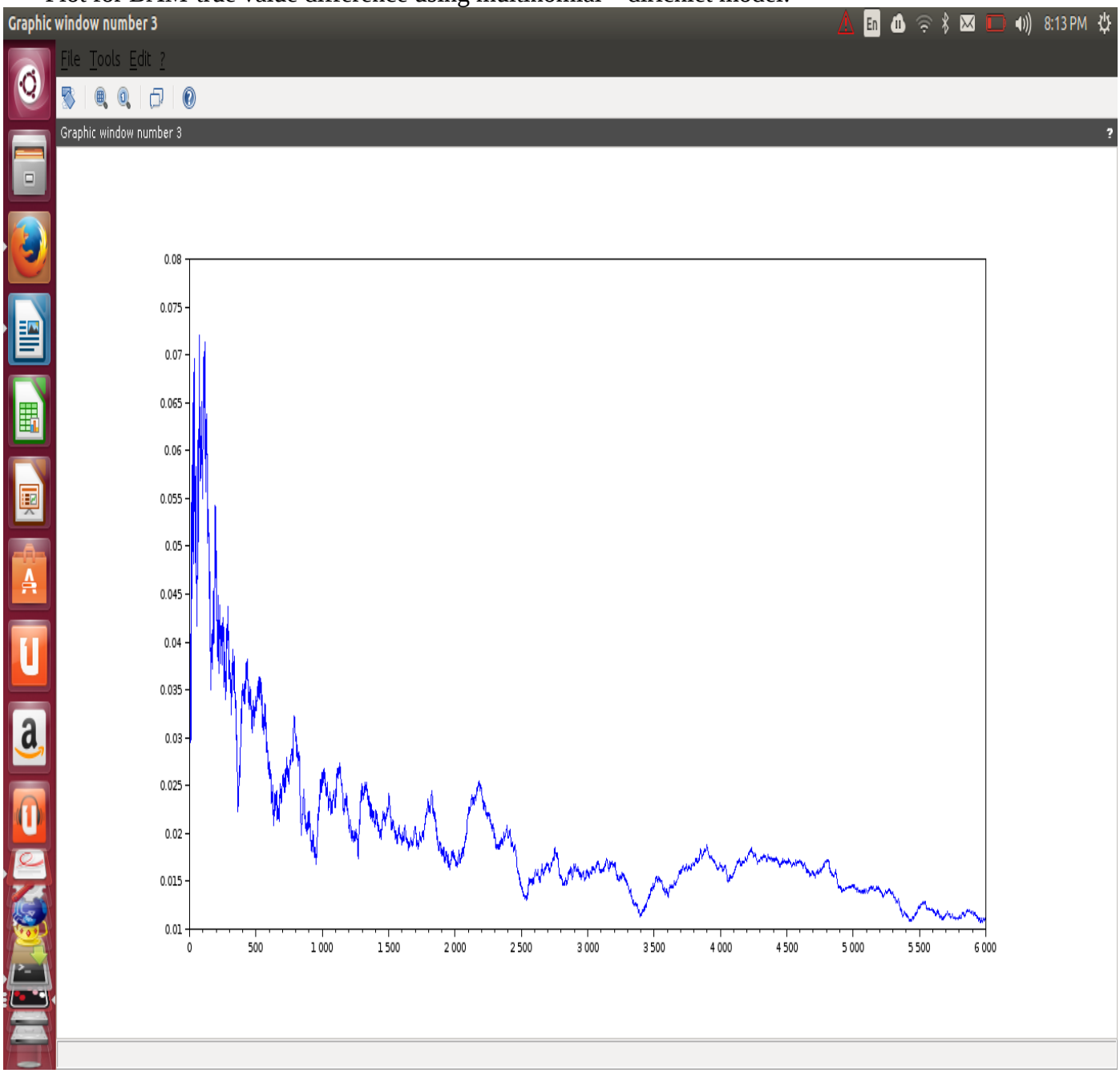


ii)
Hyperparameters:
hyp(1)=4 hyp(2)=10 hyp(3)=4 hyp(4)=10 hyp(5)=4 hyp(6)=10
The hyper-parameters are such that the mostlikely value of the parameters (modes of dirichlet distribution=hyp(i)-1 / hyp_sum-6)for evens is three times of odd numbers.
a)Plot for MAP-true value difference using multinomial – dirichlet model:



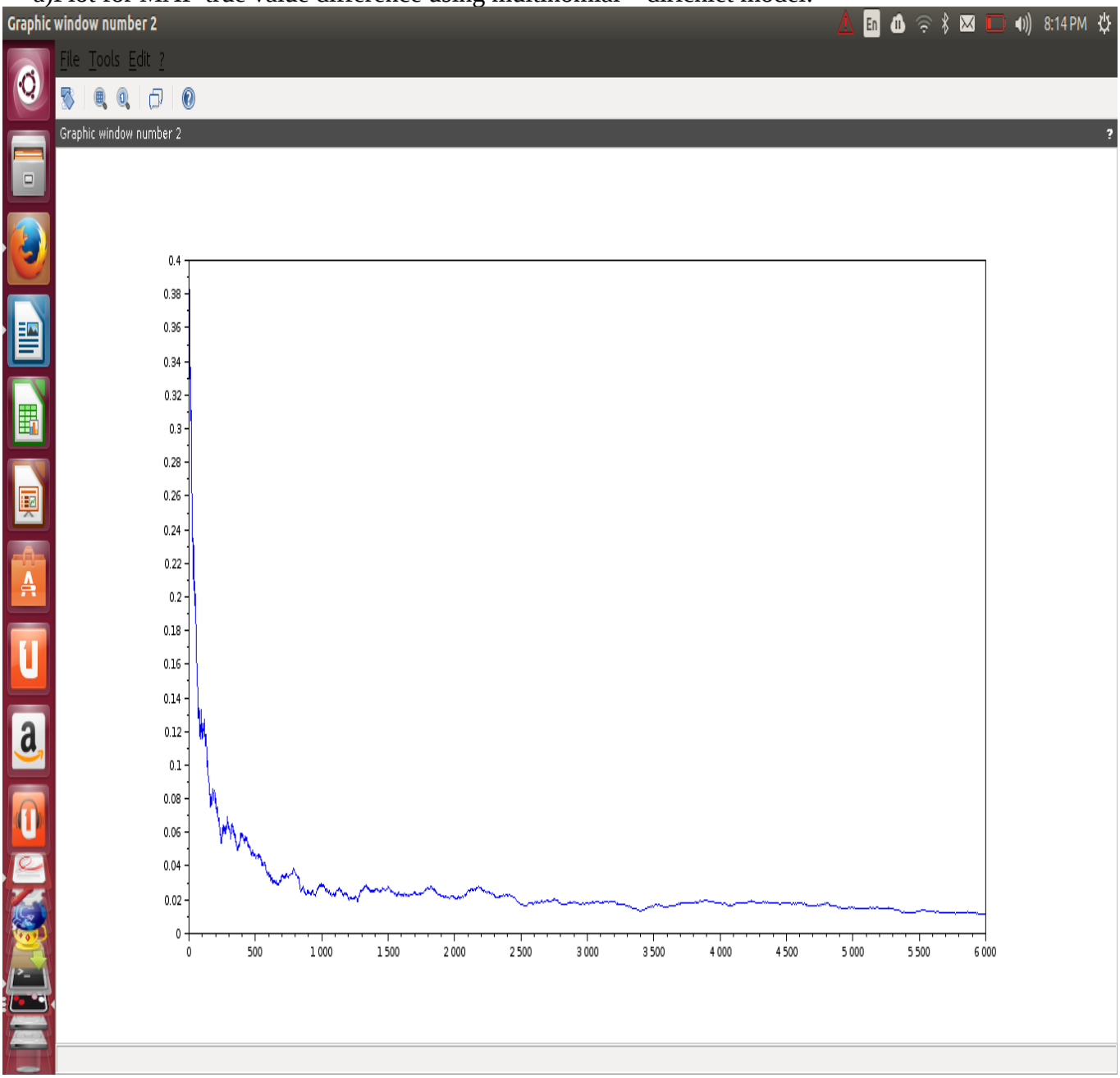
b)

Plot for BAM-true value difference using multinomial – dirichlet model:



iii)
Hyperparameters:
hyp(1)=10 hyp(2)=4 hyp(3)=10 hyp(4)=4 hyp(5)=10 hyp(6)=4
The hyper-parameters are such that the mostlikely value of the parameters (modes of dirichlet distribution=hyp(i)-1 / hyp_sum-6)for odds is three times of even numbers

a)Plot for MAP-true value difference using multinomial – dirichlet model:



b)Plot for BAM-true value difference using multinomial – dirichlet model: