Homework #08: Collective wisdom

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An example of how the estimate for the total number of jelly beans in a jar approximates the true value as the number of samples increases is presented. The study considers a jar with 1500 jelly beans stored inside of it, with a variance of $\sigma^2 = 1000$. Multiple samples are considered. Figure 1 shows how the group approaches the true value as the sample size increases. The histograms presented show the estimated values after being normalised for ease of comparison.

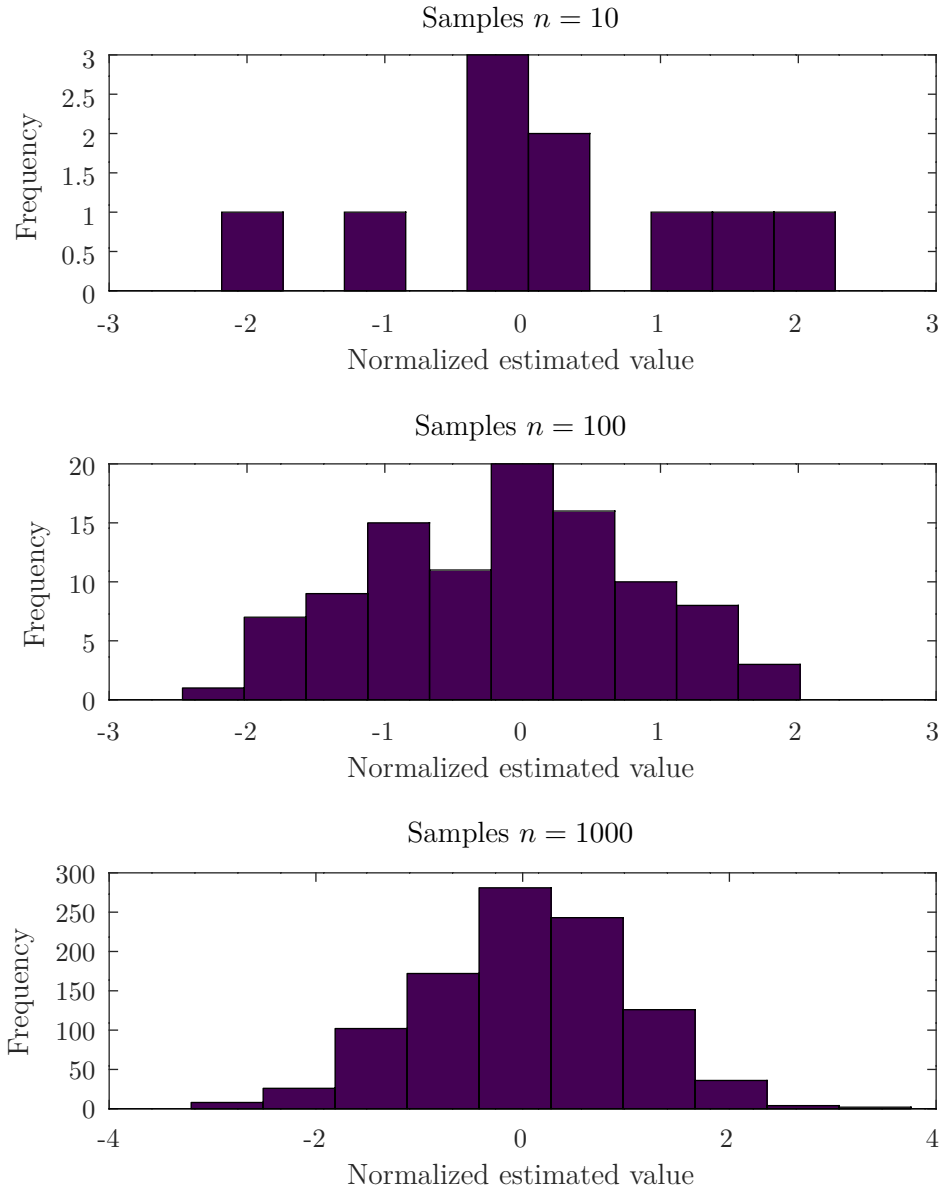

Figure 1: Histograms.

A Octave Code

```
close all
clc
clear all
pkg load statistics
%% Real value is 1500
figure(1)
subplot(3,1,1)
hist(stdnormal_rnd(10,1))
xlabel('Normalized estimated value','Interpreter','
    latex')
ylabel('Frequency','Interpreter','latex')
title('Samples $n = 10$','Interpreter','latex')
%%
subplot(3,1,2)
hist(stdnormal_rnd(100,1))
xlabel('Normalized estimated value','Interpreter','
    latex')
ylabel('Frequency','Interpreter','latex')
title('Samples $n = 100$','Interpreter','latex')
%%
subplot(3,1,3)
hist(stdnormal_rnd(1000,1))
xlabel('Normalized estimated value','Interpreter','
    latex')
ylabel('Frequency','Interpreter','latex')
title('Samples $n = 1000$','Interpreter','latex')
%%
print('-dpdflatex', './img/hw08_hist.tex', '-S400,500'
    );
```