Answer on Question #45476, Programming, Mat LAB | Mathematica | MathCAD | Maple

Problem.

Matlab: write separate functions arithmetic_mean(), rms_average(), harmonic_mean(), geometric_mean() which takes the data array as the argument and compute the respective quantities. Write a script averages which take two values xlow and xhigh and generate 10000 random numbers in
the range [xlow…xhigh], and calls the appropriate functions to compute arithmetic mean (average), rms average, geometric mean and harmonic mean.

Solution.

Code (arithmetic_mean.m)

```
function mean = arithmetic_mean(array)
    mean = sum(array)/length(array);
end
```

Code (geometric_mean.m)

```
function mean = geometric_mean(array)
    mean = prod(array.^(1/length(array)));
end
```

Code (harmonic_mean.m)

```
function mean = harmonic_mean(array)
    mean = length(array)/sum(array.^(-1));
end
```

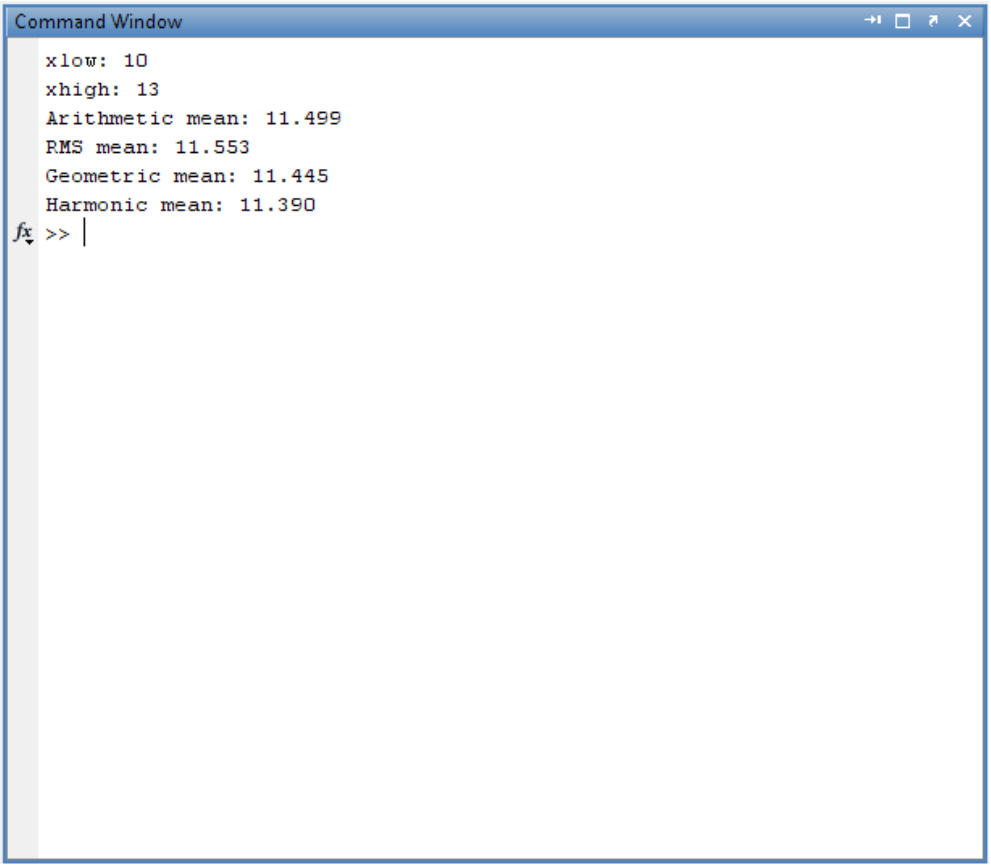
Code (rms_mean.m)

```
function mean = rms_mean(array)
    mean = sqrt(sum(array.^2)/length(array));
end
```

Code (test.m)

```
%Clear screen
clc();

% Input
xlow = input('xlow: ');
xhigh = input('xhigh: ');

% Random array
array = randi([xlow xhigh], 1, 10000);

% Arithmetic mean
AM = arithmetic_mean(array);
% RMS mean
RMS = rms_mean(array);
% Geometric mean
GM = geometric_mean(array);
% Harmonic mean
HM = harmonic_mean(array);

% Output
fprintf('Arithmetic mean: %.3f\n', AM);
fprintf('RMS mean: %.3f\n', RMS);
fprintf('Geometric mean: %.3f\n', GM);
fprintf('Harmonic mean: %.3f\n', HM);
```

Result


Command Window
xlow: 10
xhigh: 13
Arithmetic mean: 11.499
RMS mean: 11.553
Geometric mean: 11.445
Harmonic mean: 11.390
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