

Answer on Question #45470, Programming, Mat LAB | Mathematica | MathCAD | Maple

Problem.

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. Flow Chart also.

Solution.

Code

```
function test()
    %Clears screen
    clc();

    % Inputs xlow and xhigh
    xlow = input('xlow: ');
    xhigh = input('xhigh: ');

    % Generates 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);

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

% Computes arithmetic mean
function mean = arithmetic_mean(array)
    mean = sum(array)/length(array);
end

% Computes geometric mean
function mean = geometric_mean(array)
    mean = prod(array.^(1/length(array)));
end

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

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

Result

```
Command Window
xlow: 1001
xhigh: 1019
Arithmetic mean: 1010.004
RMS mean: 1010.019
Geometric mean: 1009.989
Harmonic mean: 1009.974
fx >>
```

Flowchart

