

```

clear;clc;
% Example from pp55-56
% Experimental Methods, W. Bolton (1996), Elsevier
%
%
disp("")
disp("Measurements of the electrical resistance [ohm] of a resistor")
disp("-----")
resistance = [53 48 45 49 46 48 51 57 55 55 47 49];
count = length(resistance);

% Compute the mean resistance
mean_resistance = mean(resistance);

% Compute deviation using built-in Octave command,
% deviation_squared and tabulate the results
deviation = resistance - mean_resistance;
deviation_sq = deviation.^2;

disp(" resistance deviation deviation_sq");
[resistance' deviation' deviation_sq']
count
mean_resistance

% Compute standard deviation using built-in Octave command
std_dev = std(resistance)

% Compute standard error for the two sets of experiments
stderr = std_dev/sqrt(count)

%-----
% plot analyses
%-----
figure(1)

yy = resistance;
n = length(yy);

LSD = mean(yy) - std(yy);
USD = mean(yy) + std(yy);

percentiles = prctile(yy, [25 75]); % 25th and 75th percentile
Q1 = percentiles(1); % quartile Q1
Q2 = median(yy); % quartile Q2
Q3 = percentiles(2); % quartile Q3
IQR = Q3 - Q1; % Interquartile Range (IQR)
LF = Q1 - 1.5*IQR; % Lower Fence
UF = Q3 + 1.5*IQR; % Upper Fence

% display results
%
fprintf(1, '-----\n');
fprintf(1, 'Statistical Property Value \n');
fprintf(1, '-----\n');
fprintf(1, 'Number of data: %10d\n', n);
fprintf(1, 'Minimum: %10.1f\n', min(yy));
fprintf(1, 'Maximum: %10.1f\n', max(yy));

fprintf(1, '25th Percentile: %10.2f\n', Q1);
fprintf(1, '50th Percentile: %10.2f\n', Q2);
fprintf(1, '75th Percentile: %10.2f\n', Q3);
fprintf(1, 'Interquartile Range (IQR): %10.2f\n', IQR);

```

```
fprintf(1,'LowerFence:           %10.2f\n',LF);
fprintf(1,'UpperFence:         %10.2f\n',UF);

fprintf(1,'Mode:                %10.1f\n',mode(yy));
fprintf(1,'Median:              %10.2f\n',median(yy));
fprintf(1,'Mean:                 %10.2f\n',mean(yy));

fprintf(1,'Standard Deviation (SD): %10.2f\n',std(yy));
fprintf(1,'LowerSD:               %10.2f\n',LSD);
fprintf(1,'UpperSD:                %10.2f\n',USD);

% graphical analyses
%
%subplot(1,1,1)
bar(sort(yy))
%bar(yy)
axis([0,length(yy),0,70])
line(xlim, [mean(yy), mean(yy)], 'Color', 'g', 'LineWidth', 2);
line(xlim, [mean(yy)-std(yy), mean(yy)-std(yy)], 'Color', 'r', 'LineStyle', '-.', 'LineWidth',
1.5);
line(xlim, [mean(yy)+std(yy), mean(yy)+std(yy)], 'Color', 'r', 'LineStyle', '-.', 'LineWidth',
1.5);
legend('Resistance','Mean resistance','StdDev','Location','northwest')
grid on
xlabel('Measurement')
ylabel('Resistance (ohm)')
title('Resistance of a resistor')
%
saveas(1, "page055b.png");
```