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% MATLAB Simple Program - Demonstrating basic MATLAB environment

% Clear previous data and close all figures
clc;        % Clear the command window
clear;      % Clear all variables in the workspace
close all;  % Close all open figure windows

% Step 1: Define some variables
x = 5;                % Assign value 5 to variable x
y = 3;                % Assign value 3 to variable y

% Step 2: Perform simple mathematical operations
sum_result = x + y;   % Calculate the sum of x and y
diff_result = x - y;  % Calculate the difference between x and y
prod_result = x * y;  % Calculate the product of x and y
quot_result = x / y;  % Calculate the quotient of x divided by y

% Step 3: Display the results in the command window
fprintf('The sum of %d and %d is: %d\n', x, y, sum_result);
fprintf('The difference of %d and %d is: %d\n', x, y, diff_result);
fprintf('The product of %d and %d is: %d\n', x, y, prod_result);
fprintf('The quotient of %d divided by %d is: %.2f\n', x, y, quot_result);

% Step 4: Create an array and perform some operations
arr = [1, 2, 3, 4, 5];          % Define an array
arr_sum = sum(arr);             % Find the sum of elements in the array
arr_mean = mean(arr);           % Find the mean of the array

% Display array operations results
fprintf('The sum of the array is: %d\n', arr_sum);
fprintf('The mean of the array is: %.2f\n', arr_mean);

% Step 5: Create a simple plot
x_values = 0:0.1:10;            % Define x values (from 0 to 10, with step
size of 0.1)
y_values = sin(x_values);       % Compute the sine of each x value

figure;                        % Create a new figure
plot(x_values, y_values, '-b', 'LineWidth', 2); % Plot y = sin(x)
xlabel('x values');             % Label x-axis
ylabel('y = sin(x)');           % Label y-axis
title('Sine Wave Plot');        % Set plot title
grid on;                        % Turn on the grid for the plot

% Step 6: Use a for loop to display numbers 1 to 5
for i = 1:5
    fprintf('This is number: %d\n', i);
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end

% Step 7: Use a conditional statement to check even or odd numbers
if mod(x, 2) == 0
    fprintf('%d is an even number.\n', x);
else
    fprintf('%d is an odd number.\n', x);
end

% End of the program
disp('Program execution completed!');
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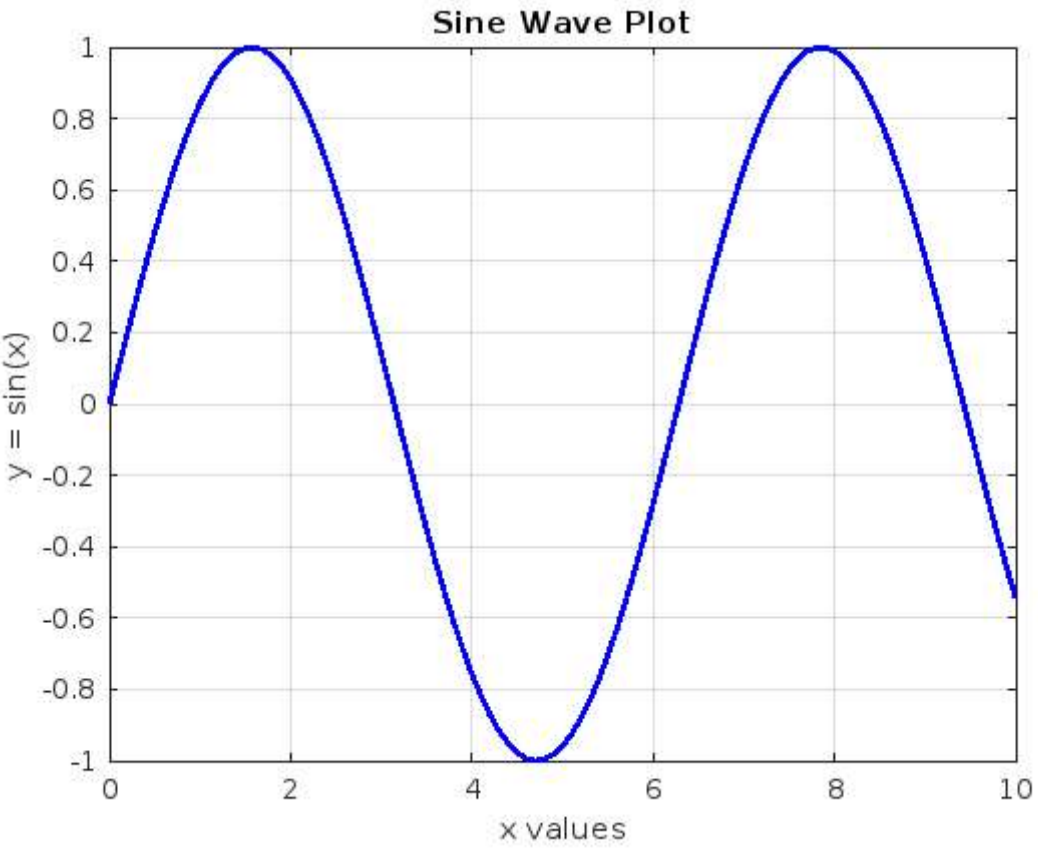
The sum of 5 and 3 is: 8
The difference of 5 and 3 is: 2
The product of 5 and 3 is: 15
The quotient of 5 divided by 3 is: 1.67
The sum of the array is: 15
The mean of the array is: 3.00
This is number: 1
This is number: 2
This is number: 3
This is number: 4
This is number: 5
5 is an odd number.
Program execution completed!
```



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