Linear Programming Problem (Optimization Toolbox application):

OBJECTIVE_1: Minimize f(x) = 2*x1 + x2

This is the function we want to minimize. In Linear Programming, this function is known as the Objective Function, and it's a linear function of the decision variables (x1 and x2 in this case).

```
% Subject to constraints:
% 1. x1 + x2 ≥ 2
% 2. x1 ≥ 0
% 3. x2 ≥ 0
% The constraints define the feasible region, i.e., the set of all possible
% values of x1 and x2 that meet these conditions. The first constraint
% ensures the sum of x1 and x2 is at least 2, while the other two
% constraints ensure that both variables are non-negative.

% Script for OBJECTIVE_1:
% Define the coefficients of the objective function:
f = [2;1]; % Objective function: Minimize f(x) = 2*x1 + x2

% Define the inequality constraints (Ax <= b):
% Since we have (x1) + (x2) ≥ 2, we multiply with (-1)
% to get (-x1) + (-x2) ≤ -2 to fit the form Ax <= b:
A = [-1, -1];
b = -2;

% Define the lower bounds for x1 and x2 to ensure x1 ≥ 0 and x2 ≥ 0:
lb = [0;0];

% Call for linprog (inbuilt function in MATLAB to find minimums and
% maximums) to solve the linear programming problem:
[x, fval, exitflag, output] = linprog(f, A, b, [], [], lb, []);

% Check if the solution was successfully found:
if exitflag ==1
    % Solution was found
    disp(['Optimal solution: x1 = ', num2str(x(1)), ', x2 = ',
num2str(x(2))]);
    disp(['Minimum value of the objective function: ', num2str(fval)]);
else
    % Solution was not found
    disp(['The problem does not have a solution or linprog failed to find
it.']);
    disp(['Exit flag: ', num2str(exitflag)]);
end
```

```
Optimal solution found.
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Optimal solution: x1 = 0, x2 = 2
Minimum value of the objective function: 2
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