Assignemnt

Decimal to Binary

```
% Name         : Mohamed Mafaz
% Roll Number : AM25M009
% Depatment    : Applied Mechanics

clc
clear

function [] = D2B(number, precision)

    before_decimal = floor(number);
    after_decimal  = number - before_decimal;   % Splitting the Decimal into
2 parts -> before_decimal, after_decimal
    before_decimal_list = [];

    % Doing Calculations to digits before decimal seperately
    while before_decimal ~= 0
        remainder        = mod(before_decimal, 2);       % 0 or 1
        before_decimal   = floor(before_decimal / 2);    % before_decimal is
not the Quotient
        before_decimal_list   = [before_decimal_list, remainder];  % Adding
to the array

    end

    decimal_after_list = [];

    % Doing Calculations to digits after decimal seperately
    digit_count = 0;
    if after_decimal ~= 0
        while after_decimal
            a = after_decimal * 2;                   % Multiply with 2 and
see if the digit before the decimal is 0 or 1
            binary = floor(a);
            decimal_after_list = [decimal_after_list, binary]; % Adding 0 or
1 to the list
            after_decimal = a - binary;              % Subtracting a with 0
or 1

            digit_count = digit_count + 1;
            if digit_count >= precision             % Incase of never ending
loop, we can exit
                break
            end
        end

    end
```

```
    fprintf("Decimal: %f | Binary: ", number)

    % Printing the before_decimal_list in reverse order, since that is the
algorithm
    for i = 0:length(before_decimal_list)-1
        fprintf("%d", before_decimal_list(end-i));
    end
    % if binary starts after decimal point, then instead of .101 we will use
0.101
    if length(before_decimal_list) == 0
        fprintf("0")
    end
    % Only print '.' if there is binary after the decimal point also
    if length(decimal_after_list) ~= 0
        fprintf(".")
    end
    % Print after decimal point binary characters if there are any
    for i = 1:length(decimal_after_list)
        fprintf("%d", decimal_after_list(i));
    end

    if digit_count >= precision
        fprintf(" (Precision reached: %d digits)", precision);
    end

    fprintf("\n")
end


% Main

numbers = [5.625, 0.8925, 205, 124.456];

for num = numbers
    if isempty(num) || ~isnumeric(num)  % Only Execute if user enters a
number
        disp('No number entered. Exiting...');

    else
        D2B(num, 8)
    end
end
```

```
Decimal: 5.625000 | Binary: 101.101
Decimal: 0.892500 | Binary: 0.11100100 (Precision reached: 8 digits)
Decimal: 205.000000 | Binary: 11001101
Decimal: 124.456000 | Binary: 1111100.01110100 (Precision reached: 8 digits)
```

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