Contents


```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 133
% Program Description
% Add binary numbers
%
% Assignment Information
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%   My contributor(s) helped me:
%     [ ] understand the assignment expectations without
%         telling me how they will approach it.
%     [ ] understand different ways to think about a solution
%         without helping me plan my solution.
%     [ ] think through the meaning of a specific error or
%         bug present in my code without looking at my code.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION

Ask the user for an input and check to see if it's valid. Repeat until user has entered a binary number.

```
while true
    binary_in_A = input('Enter a binary number: ');
    if binary_in_A ~= 1 & binary_in_A ~= 0
        fprintf('You have not entered a binary number. Try again and enter a 1 or 0.\n')
    else
        break
    end
end

% Ask the user for another input and check to see if it's valid. Repeat until
% user has entered a binary number.
while true
    binary_in_B = input('Enter another binary number: ');
    if binary_in_B ~= 1 & binary_in_B ~= 0
        fprintf('You have not entered a binary number. Try again and enter a 1 or 0.\n')
    else
        break
```

```
    end
end

% Add the binary values to a vector
binary_pair = [binary_in_B, binary_in_A];

% Create the truth table
truth_table = [0 0 0 0; 0 1 1 0; 1 0 1 0; 1 1 0 1];
```

CALCULATIONS

Compare the user-entered binary numbers with the B and A columns (first two columns) in the truth table. Depending on what row the inputed numbers correspond with, the sum and carry numbers in the table are combined (concatenated) to produce an integer.

```
if binary_pair == truth_table(1, 1:2) % Compare with first 2 values of first row in truth table
    sum = int2str(truth_table(1, 3)); % Return the sum value and convert to a string
    carry = int2str(truth_table(1, 4)); % Return the carry value and convert to string
    answer = str2double((strcat(carry, sum))); % Concatenate the carry and sum strings and convert to a number

elseif binary_pair == truth_table(2, 1:2) % Compare with first two values of second row in truth table
    sum = int2str(truth_table(2, 3)); % Return the sum value and convert to a string
    carry = int2str(truth_table(2, 4)); % Return the carry value and convert to string
    answer = str2double((strcat(carry, sum)));  % Concatenate the carry and sum strings and convert to a number

elseif binary_pair == truth_table(3, 1:2) % Compare with first two values of third row in truth table
    sum = int2str(truth_table(3, 3)); % Return the sum value and convert to a string
    carry = int2str(truth_table(3, 4)); % Return the carry value and convert to string
    answer = str2double((strcat(carry, sum))); % Concatenate the carry and sum strings and convert to a number

elseif binary_pair == truth_table(4, 1:2) % Compare with first two values of fourth row in truth table
    sum = int2str(truth_table(4, 3));% Return the sum value and convert to a string
    carry = int2str(truth_table(4, 4));% Return the carry value and convert to string
    answer = str2double((strcat(carry, sum))); % Concatenate the carry and sum strings and convert to a number

end
```

OUTPUTS

Print the binary sum

```
fprintf('Binary sum = %i \n', answer)
```

ACADEMIC INTEGRITY STATEMENT

I have not used source code obtained from any other unauthorized source, either modified or unmodified. Neither have I provided access to my code to another. The project I am submitting is my own original work.

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