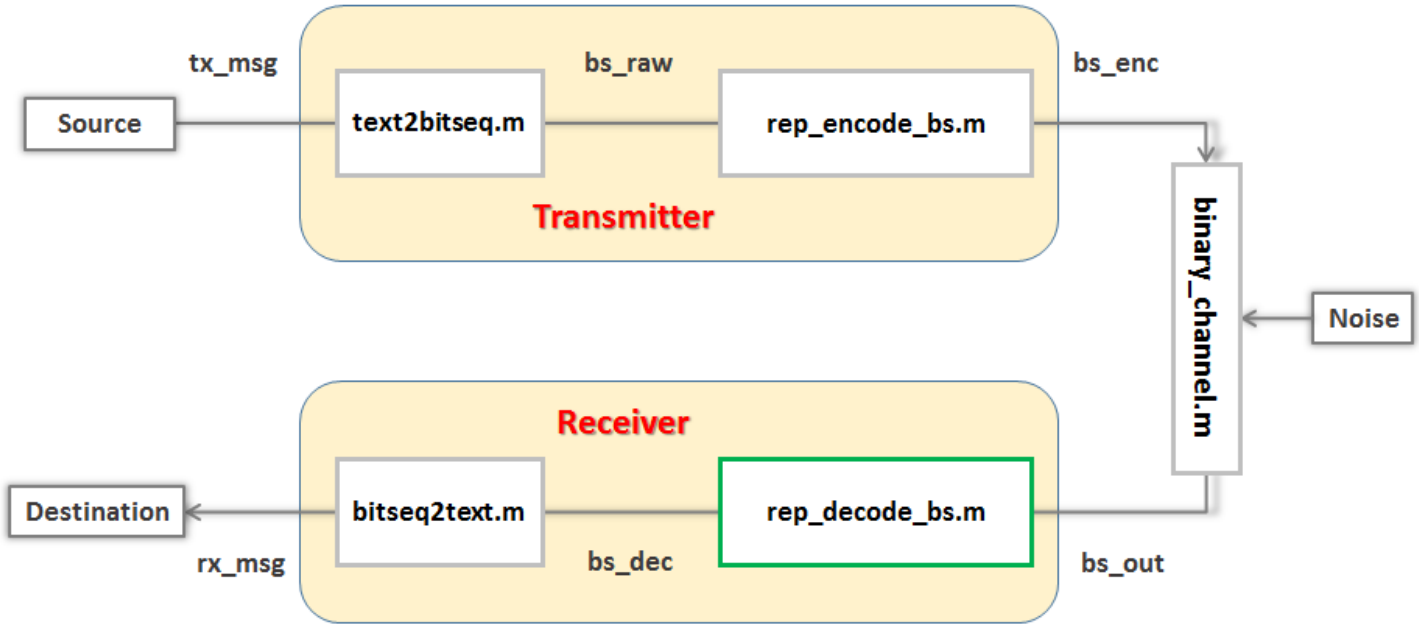
LAB 9 TASK 2 - (3,1,3) REPETITION DECODER (1/1 point)

In this task, you will write code implementing the repetition decoder, rep_decode_bs.m, which is highlighted in green below.




```
rep = 3;
tx_msg = tx_msg_gen();                          % pick a random text message
display(['The encoded message: ' tx_msg]);      % display the text message
bs_raw = text2bitseq(tx_msg);                   % change text message to bit sequence
bs_enc = rep_encode_bs(bs_raw, rep);
bs_out = binary_channel1(bs_enc);               % simulate the transmission with noise

bs_dec = [];
for i = 1:(length(bs_out)/rep),                 % loop to get all codewords
    codeword = bs_out((i-1)*rep+1:i*rep);       % get the ith codeword

    % Modify the code below to
    %  1. decode the repetition codeword with error correction and return 1 bit information for eac
    %  2. reconstruct the original bit sequence
    countOnes = 0;
```

Correct

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```
      num_ones = sum(codeword);
      if (num_ones > rep/2)
          msgblk = 1;
      else
          msgblk = 0;
      end
      bs_dec = [bs_dec msgblk];

% alternative, more efficient solution
% replace the entire for loop, including the line bs_dec = []; with:

bs_dec = zeros(1,length(bs_out)/rep); % preallocate to improve speed
for i = 1:(length(bs_out)/rep),                % loop to get all codewords
    codeword = bs_out((i-1)*rep+1:i*rep);      % get the ith codeword
    num_ones = sum(codeword);
    if num_ones > rep/2,
        bs_dec(i) = 1;
    end
end
```

The encoded message: It was the season of Light, it was the season of Darkness.
The decoded message: It was the season of Light, it was the season of Darkness.

Check | Reset | Save | Hide Answer *You have used 1 of 10 submissions*

INSTRUCTIONS

Step 1: Build (3, 1, 3) repetition decoder

The code in the above window simulates the transmission of a text message using repetition code. The code will first generate a random text message and its corresponding binary sequence **bs_raw**. The binary sequence **bs_raw** will then be encoded by using the (3,1,3) repetition code and transmitted over a binary channel assuming that at most one bit error occurs within each codeword. Your job is to decode the codewords and recover the original text message.

To complete this task, you should modify the code under the comments starting with

```
% Modify the code below to
```

Your code should

1. Decode the repetition codeword with error correction and return one bit for each code word;

2. Recover the original bit sequence by concatenating the recovered bits.

Step 2: Submit your work

Once you have completed your work, click on the **Check** button to submit your answer.

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