```
function rec_sample_seq  = BSC(sample_seq,fs,p,channel_type)
%
% Inputs:
%   sample_seq:     The input sample sequence to the channel
%   fs:             The sampling frequency used to generate the sample sequence
%   p:              The bit flipping probability
%   channel_type:   The type of channel, 'independent' or 'correlated'
% Outputs:
%   rec_sample_seq: The sequence of sample sequence after passing through the channel
%
% This function takes the sample sequence passing through the channel, and
% generates the output sample sequence based on the specified channel type
% and parameters

sample_seq      = ~~sample_seq;
rec_sample_seq  = zeros(size(sample_seq));
rec_sample_seq  = ~~rec_sample_seq;

if (nargin <= 3)
    channel_type = 'independent';
end

switch channel_type

    case 'independent'
        channel_effect = rand(size(rec_sample_seq))<=p;
    case 'correlated'
        channel_effect = rand(1,length(rec_sample_seq)/fs)<=p;
        channel_effect = repmat(channel_effect,fs,1);
        channel_effect = channel_effect(:)';
end

rec_sample_seq = xor(sample_seq,channel_effect);
rec_sample_seq = rec_sample_seq + 0;
```