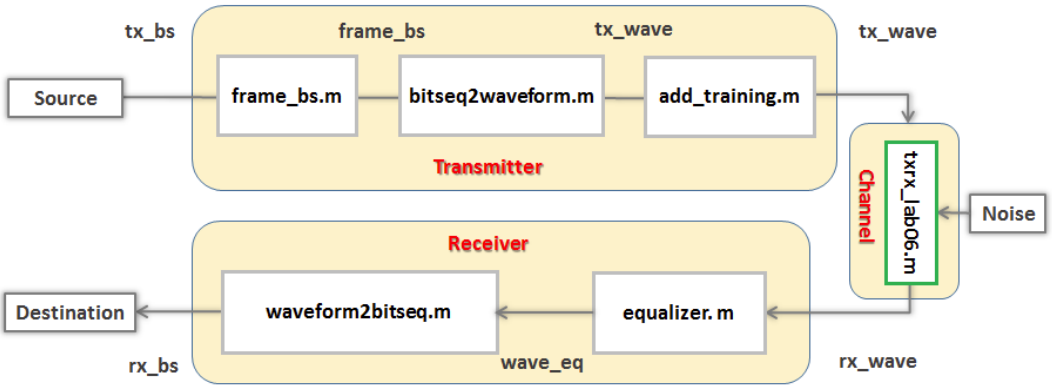
LAB 6 TASK 1 - CHANNEL ESTIMATION (1 point possible)

In order to design the equalizer, we need a model of the channel. In this task, you will use the exponential model to fit the response of the channel and estimate the parameters of the exponential step response.

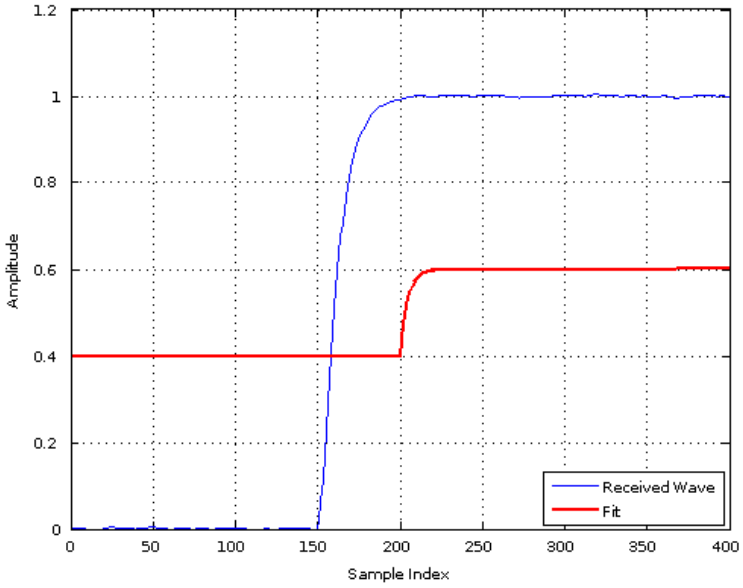



```
tx_wave = [zeros(1,150) ones(1,250)];   % define step-like waveform
rx_wave = txrx_lab06(tx_wave);          % transmit waveform through channel

% fit_rcv(rx_wave,c,d,k,a) fits rx_wave by a function of the form
%     y(n) = c + k*(1-a^(n-d)) for n >= d and 0 otherwise.
% modify the values below to find the correct fit
c = 0.4;
d = 200;
k = 0.2;
a = 0.8;

% do not modify code below
mse = fit_rcv(rx_wave,c,d,k,a);  % fit channel output to model
display(['MSE = ' num2str(mse)]); % print out MSE of fit

```

Unanswered

Figure 1

Help



MSE = 0.17672

Run Code

Check Save *You have used 0 of 10 submissions*

INSTRUCTIONS

The code window above contains a MATLAB script similar to that of Lab 2 Task 1. Your task here is to use the function `fit_rcv` to fit the channel response and estimate the value of the parameters a and k, which will be used to build the equalizer in the next task. For more information, check the units on Lab 2 - Step Response (https://courses.edx.org/courses/HKUSTx/ELEC1200.1x/3T2014/courseware/7cc92d7c1f1f4d1c8f9c17c3e4ee7698/7aa62dca2e524ff08e526b7782265a65/1) and Lab 2 Task 1 - Model the Channel (https://courses.edx.org/courses/HKUSTx/ELEC1200.1x/3T2014/courseware/7cc92d7c1f1f4d1c8f9c17c3e4ee7698/7aa62dca2e524ff08e526b7782265a65/3).

Adjust the four parameters c, d, k, a to fit the received waveform until the **MSE** value returned by the MATLAB code is less than $1 * 10^{-3}$. You may want to take note of the final value of the parameters since you will use it in the next lab task. Note that this channel's step response is not described perfectly by the exponential step response, so you will not be able to fit it as well as in previous labs.

Once you obtain the desired **MSE**, remember to click on the **Check** button to submit your work.