How to run code:

Before running this code, two toolboxes are required: the Signal Processing toolbox and the Communications toolbox.

1. We use the Signal Processing Toolbox to run the rcosdesign which we call in Multirate Components/Filter.m line 4.
2. We use the Communications Toolbox to run awgn which we call in Comm Components/Channel.m line 24.

To actually execute the code, begin from the main.m file. As long as the Comm Components folder, Multirate Components folder and Tools folder are all located in your current folder, then all you need to do is hit run and it will work.

On line 7, there is a variable Experiment_Number, which can be adjusted depending on which of the experiments from section 2.6 section of the project description.

Set Experiment_Number = 1 to run with following values for SNR/ f_0 / Time Offset

a. SNR = 100 dB / Clean channel
b. f_0 = 0 Hz
c. Time offset = -2.5 msec to 2.5 msec, step = 0.0625 msec
d. Number of simulations = 100 per point

Set Experiment_Number = 2 to run with following values for SNR/ f_0 / Time Offset

a. SNR = 100 dB / Clean channel
b. $Time\ offset$ = 0 msec
c. f_0 = -1500 Hz to 1500 Hz, step = 125 Hz
d. Number of simulations = 100 per point

Set Experiment_Number = 3 to run with following values for SNR/ f_0 / Time Offset

a. SNR = -3 to 15 dB, step size = 0.5 dB
b. f_0= 0 Hz
c. $Time\ offset$ = 0 $msec$

Set Experiment_Number = 4 to run with following values for SNR/ f_0 / Time Offset

a. SNR = -3 to 15 dB, step size = 0.5 dB
b. f_0= 600 Hz
c. Time offset = 2.5/10 msec

Set Experiment_Number = 5 to run with following values for SNR/ f_0 / Time Offset

a. SNR = -3 to 15 dB, step size = 0.5 dB
b. f_0= 62.5Hz
c. $Time\ offset$ = 2.5/80 $msec$