EE311 - Matlab Assignment IV

In this assignment, you will design several models for noise cancellation in simulink and observe their behavior. You will start with a simple noise canceling system and add several elements as you progress, observe their effects and finalize it with a complete Active Noise Control (ANC). You do not have to use the same model page for all of them. Submit your models and project report to sucourse under matlab assignment 4 segment.

a) Create a simple noise canceling system by only subtracting a colored noise from itself. How does it perform?

b) Then add a channel (with coefficients of [0.5 0.1 0.2 0.4 0 0 -0.125 0.3 0.5 0 0.075 -0.25 -0.4]) to your ANC design and report how the end result is changed.

c) Now use an adaptive LMS filter (i.e. the one called "LMS Update" in simulink) for noise cancellation. How does it perform against the effect of the channel compared to the previous design?

d) ANC filters won't work perfectly in real-world conditions. Therefore, to simulate this effect, add a Secondary path filter (with coefficients of [0 0 -0.5 -0.5 -0.3 0.2 -0.1 0.5 -0.5]) to your ANC filter. How did your system respond to this effect?

e) Add a Secondary Path Estimation to your design to compensate for the Secondary Path effect. Don't forget that you need to train your estimator before using the ANC model. Comment on the results in your report.