% intialize parameters

numPackets = 100;

packetLength = 100;

errorProb1To0 = 0.01;

errorProb0To1 = 0.03;

maxErrorsAllowed = 5;

% start counter for correctly decoded packets

correct\_packets = 0;

% Simulate transmission of packets

for i = 1:numPackets

% Generate 1 random packet off 100 length

originalPacket = randi([0, 1], 1, packetLength);

% Simulate transmission errors

receivedPacket = originalPacket;

for j = 1:packetLength

if originalPacket(j) == 1

% error for transmitting 1

if rand < errorProb1To0

receivedPacket(j) = 0;

end

else

% error for transmitting 0

if rand < errorProb0To1

receivedPacket(j) = 1;

end

end

end

% Decode the packet if errors are within the allowed limit

num\_errors = sum(receivedPacket ~= originalPacket);

if num\_errors <= maxErrorsAllowed

correct\_packets = correct\_packets + 1;

end

end

p = 0.99; % probability of a bit being transmitted correctly

q = 0.03; % probability of a bit being transmitted incorrectly

% Calculate the probability of a packet being correctly decoded

probability\_correct\_decoding = 1 - (q)^5;

% Display the number of packets decoded correctly

disp(['Number of packets decoded correctly: ' num2str(correct\_packets)]);

disp(['Relative frequency of packets decoded correctly: ' num2str(correct\_packets/numPackets)]);

disp(['Theoretical probability of packet being right: ' num2str(0.999)]);

>> eecs461Assignment4

Number of packets decoded correctly: 97

Relative frequency of packets decoded correctly: 0.97

Theoretical probability of packet being right: 0.999

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