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%% task 186
clear;
clc;

%initialise variables
fs = 8000;
L = 86;
fcent = [697;770;852;941;1209;1336;1477;1633];
number = '01205978436';
k = 500;
f = 0;

sum = 0;

for i = 1:k
    a = dtmfdial(number, -4);

    %pass input through bandpass
    a = bandpass(a, [697 1633], fs);

    %normalise signal
    a1 = a * (1 / max(abs(a)));

    %Noise gate
    for n = 1:size(a,2)
        %0 out samples that are 0.2 of max magnitude
        if abs(a1(n)) < 0.2
            a(n) = 0;
        end
    end

    %pass through bandpass again to clear added noise
    a = bandpass(a, [697 1633], fs);

    %get the keys
    keys = dtmfrun(a,L,fs);

    %compare the generated key vs the number input
    s1 = size(keys,2);
    s2 = size(number,2);

    if s1 > s2
        s3 = s2;
    else
        s3 = s1;
    end

    for j = 1:s3
        if keys(j) == number(j)
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            sum = sum + 1;
        end

        f = f + 1;
    end

end

%calc success %
disp(sum / f);
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