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% Diego Alba MSB HW7

GT = zeros(11,18);

GT(1,1:3) = [1 -1 -1];
GT(2,[2 4 5]) = [1 -1 -1];
GT(3,[4 14 6 13]) = [1 -1 -1 -1];
GT(4,[6 17 7]) = [1 -1 -1];
GT(5,[7 12 18 8]) = [1 -1 -1 -1];
GT(6,[8 9 15]) = [1 -1 -1];
GT(7,[9 12 10]) = [1 1 -1];
GT(8,[10 13 11]) = [1 1 -1];
GT(9,[12 13]) = [1 -1];
GT(10,[5 11 6]) = [1 1 -1];
GT(11,[5 4 16 9 8]) = [-1 1 1 1 1];
masterGT = GT;

D = [0.03, 0.048];
m = [1 3 15 16 17 18];
V = [[5.17 0.578 0.353 8.33 1.61 0.334];...
      [7 1.28 0.725 12.9 0.922 0.286]]/10^4;

Vmmodel = [12 5 9];
Vc = zeros(6,11);
k=0;
for i = 1:2 % D
    for j = 1:3 % model
        k = k+1;
        M = [m Vmmodel(j)];
        Vm = [V(i,:); 0];

        GTm = masterGT(:,M);
        GT(:,M)=[];
        GTC = GT;

        Vc(k,:) = -GTC^-1*GTm*Vm';
        GT = masterGT;
    end
end

DilutionRate = repmat(D',3,1);
Model = repmat([1,2,3]',2,1);
V =array2table(Vc);
results = [table(DilutionRate,Model),V(:,1:3)];
disp(results)
disp('\n')
results = [table(DilutionRate,Model),V(:,4:6)];
disp(results)
disp('\n')
results = [table(DilutionRate,Model),V(:,7:9)];
disp(results)
disp('\n')

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results = [table(DilutionRate,Model),V(:,10:11)];
disp(results)

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DilutionRate	Model	Vc1	Vc2	Vc3
0.03	1	0.0004592	0.0002295	0.0002297
0.048	2	0.0004592	0.0004592	-0.00020435
0.03	3	0.0004592	-0.00020455	0.00066375
0.048	1	0.000572	0.0003787	0.0001933
0.03	2	0.000572	0.000572	-0.00058065
0.048	3	0.000572	-0.00039525	0.00096725

\n	DilutionRate	Model	Vc4	Vc5	Vc6
	0.03	1	-0.00020435	-0.00036535	-0.00039875
	0.048	2	-0.00036535	-0.00062845	-0.00066375
	0.03	3	-0.00020435	-0.00036535	3.53e-05
	0.048	1	-0.00058065	-0.00067285	-0.00070145
	0.03	2	-0.00067285	-0.00089475	-0.00096725
	0.048	3	-0.00058065	-0.00067285	7.25e-05

\n	DilutionRate	Model	Vc7	Vc8	Vc9
	0.03	1	-0.00043405	-0.00043405	-0.00043405
	0.048	2	-0.00043405	-0.00020435	0.0002297
	0.03	3	-0.00043405	-0.0008681	-0.00043405
	0.048	1	-0.00077395	-0.00077395	-0.00077395
	0.03	2	-0.00077395	-0.00058065	0.0001933
	0.048	3	-0.00077395	-0.0015479	-0.00077395

\n	DilutionRate	Model	Vc10	Vc11
	0.03	1	0	0.00043385
	0.048	2	0.0002297	0.00043385
	0.03	3	-0.00043405	0.00043385
	0.048	1	0	0.00095935
	0.03	2	0.0001933	0.00095935
	0.048	3	-0.00077395	0.00095935