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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;

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

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