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1 function record = Static_no_record(P, MatData, MatState, algorithm_type , max_iter)
2   record.P = P; % Saves the applied forces
3   record.R = []; % Init internal force
4   U_conv = 0; % Initialized last converged displacement as 0
5   Delta_U = 0; % Initialized distance from last converged displacement was 0
6
7   switch algorithm_type % Checks which algorithm is used
8       case "Newton" % N-R method
9           tag = 1;
10          case "ModifiedNewton" % Modified N-RMethod
11              tag = 2;
12          case "ModifiedNewton -initial" % Modified N-R Method with initial elastic tangent
13              tag = 3;
14      end
15      for n = 1:numel(P)-1 % Loop over load steps
16          conv = 0; % Not converged at the beginning of the load
17          j = 1; % Iteration counter reset to 1
18          switch tag % Checks for modified N-R Method
19              case 2
20                  algorithm_type = "ModifiedNewton";
21                  Ktan = MatData.A*MatState.Pres.Et/MatData.L; % Tangent stiffness
22              case 3
23                  algorithm_type = "ModifiedNewton -initial";
24                  Ktan = MatData.A*MatData.E/MatData.L; % Initial stiffness
25              end
26          while (j <= max_iter && conv == 0) % Loop over Newton-Raphson iterations while not converged
27              MatState = Mate25n(MatData,MatState); % Update the material state
28              R = MatData.A*MatState.Pres.sig; % Calculate the internal resisting force
29              Unb = P(n+1)-R; % Calculate the unbalance force
30              if (abs(Unb) < 1.e-5) % norm convergence criteria is met
31                  record.U(n+1) = U_conv; % Record the converged displacement
32                  record.R(n+1) = R; % Record the internal resisting force
33                  Delta_U = 0; % Reset total displacement from last displacement
34                  MatState.eps(1,2) = 0; % Reset total displacement from last displacement
35                  MatState.eps(1,3) = 0; % Reset incremental displacement from last displacement
36                  MatState.Past = MatState.Pres; % Commitees the present to the past. Total Strain remains
37                  conv = 1; % Convergence is true
38              else
39                  if algorithm_type == "Newton" % Checks for Newton Algorithm to be used
40                      Ktan = MatData.A*MatState.Pres.Et/MatData.L; % Tangent stiffness
41                  end
42                  if j == max_iter
43                      disp("Could not converged using " + algorithm_type + newline + "Switching to Newton-Raphson Method");
44                      j = 1; algorithm_type = "Newton"; % Switch to Newton if not converged
45                  end
46                  delta_U = Unb/Ktan; % Calculate the horizontal movement
47                  Delta_U = Delta_U + delta_U; % Calculate total displacement from last displacement
48                  U_conv = U_conv + delta_U; % Calculate converged displacement
49                  MatState.eps(1,1) = U_conv/MatData.L; % Total strain
50                  MatState.eps(1,2) = Delta_U/MatData.L; % Total incremental strain from last converged state
51                  MatState.eps(1,3) = delta_U/MatData.L; % Last incremental strain
52                  j = j + 1; % Iteration counter
53              end
54          end
55      end
56 end

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