

```

Quit[];

(* METODO SOR *)

(* Esempio 1. *)

n = 3;
a = {{7, 3, 0}, {2, -9, 4}, {0, -4, 12}};
b = {18, 12, 6};
x = Table[xx[i], {i, 1, n}];
MatrixForm[a]
Det[a]
MatrixForm[b]
sys = Thread[Dot[a, x] == b];
xsol = x /. Solve[sys, x][[1]] // N


$$\begin{pmatrix} 7 & 3 & 0 \\ 2 & -9 & 4 \\ 0 & -4 & 12 \end{pmatrix}$$

-716


$$\begin{pmatrix} 18 \\ 12 \\ 6 \end{pmatrix}$$

{2.81564, -0.569832, 0.310056}

Clear[eq, f, ff]
Do[eq[i] = Reduce[sys[[i]], xx[i]], {i, 1, n}];
Do[ff[i] = eq[i][[2]], {i, 1, n}];
f = Table[ff[i], {i, 1, n}]


$$\left\{ \frac{18}{7} - \frac{3 \text{xx}[2]}{7}, -\frac{4}{3} + \frac{2 \text{xx}[1]}{9} + \frac{4 \text{xx}[3]}{9}, \frac{1}{2} + \frac{\text{xx}[2]}{3} \right\}$$


xk[0] = Table[0.0, {i, 1, n}]
kmax = 20; tol = 1.0 × 10-6;
ω = 1.028;
k = 0;
While[k < kmax,
  Do[
    sysold = Table[xx[j] == xk[k][[j]], {j, i + 1, n}];
    sysnew = Table[xx[j] == xtemp[j], {j, 1, i - 1}];
    sys1 = Join[sysnew, sysold];
    sol1 = Solve[sys1, x][[1]];
    (*Print[i, sysold, sysnew, sys1, sol1];*)
    xtemp[i] = ω * (f[[i]] /. sol1 // N) + (1. - ω) * xk[k][[i]];
    , {i, 1, n}];
  xk[k + 1] = Table[xtemp[i], {i, 1, n}];
  norm = Max[Abs[xk[k + 1] - xk[k]]]; Print[k, " ", norm]; If[norm ≤ tol, Break[]];
  k++]
Print[xk[k]]
{0., 0., 0.}

```

Solve::svars: Equations may not give solutions for all "solve" variables. >>

Solve::svars: Equations may not give solutions for all "solve" variables. >>

Solve::svars: Equations may not give solutions for all "solve" variables. >>

General::stop: Further output of Solve::svars will be suppressed during this calculation. >>

0 2.64343

1 0.26381

2 0.0939712

3 0.00237374

4 1.43952×10^{-6}

5 1.5573×10^{-7}

{2.81564, -0.569833, 0.310056}