per risolvere problema di P.L. con il SIMPLESSO vai al n.40

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InputMode := Word

tra_r_c(v) := VECTOR([v_i], i, 1, DIM(v))

tra_c_r(v) := VECTOR(v_{i,1}, i, 1, DIM(v))

append_righe(v, v_) :=
  Prog
    If DIM(v ROW 1) = 1
       vt := tra_r_c(v)
       vt := v'
    If DIM(v_ ROW 1) = 1
       vt_ := tra_r_c(v_)
       vt_ := v_'
    APPEND_COLUMNS(vt, vt_)'

append_columns_(v, v_) :=
  Prog
    i := 1
    vt := v
    Loop
      vt := APPEND_COLUMNS(vt, v_↓i)
      If i = DIM(v_)
         RETURN vt
         i :+ 1

b(a, r) := VECTOR(VECTOR(IF(i = r, a_{i,j} / a_{i,i}, a_{i,j}), j, 1, DIM(a')), i, 1, DIM(a))

c(a, r) := VECTOR(VECTOR(IF(i ≠ r, (b(a, r))_{i,j} + (b(a, r))_{r,j} ·(- (b(a, r))_{i,r}), (b(a, r))_{i,j}), j,
  1, DIM(a')), i, 1, DIM(a))

pivot3(a) :=
  Prog
    a_ := a
    r := 1
    Loop
      a_ := c(b(a_, r), r)
      If r = DIM(a)
         RETURN a_
         r :+ 1

tra_rett(a, vu, ve) := VECTOR(VECTOR(IF(i ≠ vu ∧ j ≠ ve, a_{i,j} - a_{vu,j} ·a_{i,ve} / a_{vu,ve}, a_{i,j}), j, 1,
  DIM(a')), i, 1, DIM(a))

div_rig_piv(a, vu, ve) := VECTOR(VECTOR(IF(i = vu, a_{i,j} / a_{vu,ve}, a_{i,j}), j, 1, DIM(a')), i, 1, DIM(a))

azz_col_piv(a, vu, ve) := VECTOR(VECTOR(IF(i ≠ vu ∧ j = ve, 0, a_{i,j}), j, 1, DIM(a')), i, 1, DIM(a))

tra_rett_(a, vu, ve) := azz_col_piv(div_rig_piv(tra_rett(a, vu, ve), vu, ve), vu, ve)

t1(tp, va, a) := APPEND_COLUMNS(APPEND_COLUMNS(tp, va), APPEND_COLUMNS(a))
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t2(tp, va, a) := append_righe([APPEND([Tassi], [Var], MAP_LIST(APPEND(x, k), k, 1, DIM(a') - 1),
  [Ter.noti])], t1(tp, va, a))

smpr_(tp, a) := VECTOR(Σ_{j=1}^{DIM(a)} tp_{j,1} ·a_{j,i}, i, 1, DIM(a'))

smpr(tp, a) := APPEND([Σ tp,  Ci], VECTOR(Σ_{j=1}^{DIM(a)} tp_{j,1} ·a_{j,i}, i, 1, DIM(a')))

smpr(tp, a) := APPEND([Σ tp,  Ci], smpr_(tp, a))

tra_va(va) := tra_r_c(MAP_LIST(APPEND(x, k), k, tra_c_r(va)))

t3(tp, va, a) := append_righe(t2(tp, tra_va(va), a), [smpr(tp, a)])

t4(tp, va, cfo, a) := append_righe(t3(tp, va, a), [APPEND([Tas, pro], cfo, [ ])])

t4(tp, va, cfo, a) := append_righe(t3(tp, va, a), [APPEND([Tas, pro], cfo, [con])])

totali_(tp, a, cfo) := VECTOR((smpr_(tp, a))_i + cfo_i, i, 1, DIM(a') - 1)

tra_v1(a) :=
  Prog
    Loop
      If POSITION(?, a) = false
         RETURN a
      a := REPLACE(0, a, POSITION(?, a))

totali_(tp, a, cfo) := tra_v1(VECTOR((tra_v1(smpr_(tp, a)))_i + cfo_i, i, 1, DIM(a') - 1))

t5(tp, va, cfo, a) := append_righe(t4(tp, va, cfo, a), [APPEND([Tot,  ], totali_(tp, a, cfo), [
  ])])

fe(a, e) := VECTOR(IF(i = e + 2, ↓,  ), i, 1, 2 + DIM(a'))

t6(tp, va, cfo, a, e) := append_righe(fe(a, e), t5(tp, va, cfo, a))

fu(a, u) := VECTOR(IF(i = u + 2, [→], [ ]), i, 1, 5 + DIM(a))

estra_mas(a) :=
  Prog
    a__ := MAX(a)
    If a__ ≤ 10^(-9)
       RETURN false
    a1 := POSITION(a__, a)
    mas := [a1]
    Loop
      a := REPLACE(0, a, a1)
      If MAX(a) ≠ a__
         RETURN mas
      a1 := POSITION(a__, a)
      mas := APPEND(mas, [a1])

ve(tp, a, cfo) := estra_mas(totali_(tp, a, cfo))

estra_pos(v) :=
  Prog
    v_ := SELECT(v↓k < 0, k, 1, DIM(v))
    v__ := VECTOR(v↓(v_↓i), i, 1, DIM(v_))
    m_ := MAX(v__)
    POSITION(m_, v)

quo(a, ve_) := VECTOR(IF(a_{i,ve_} ≠ 0, a_{i,DIM(a')} / a_{i,ve_}, 0), i, 1, DIM(a))
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vu(a, ve_) :=
  Prog
    c_ := estra_pos(quo(a, ve_))
    If c_ = false
       RETURN false
       c_

max_neg(v) := MAX(VECTOR(IF(v_i ≥ 0, -∞, v_i), i, 1, DIM(v)))

ve_vu_(a, ve_) :=
  Prog
    a_ := VECTOR(vu(a, ve_↓i), i, 1, DIM(ve_))
    b_ := VECTOR(max_neg(quo(a, ve_↓i)), i, 1, DIM(ve_))
    ve__ := ve_↓POSITION(MAX(b_), b_)
    vu__ := a_↓POSITION(MAX(b_), b_)

t7(tp, va, cfo, a, u, e) := APPEND_COLUMNS(fu(a, u), t6(tp, va, cfo, a, e))

div_rig_piv_(a, vu_, ve_) := VECTOR(VECTOR(IF(i = vu_, -a_{i,j} / a_{vu_,ve_}, a_{i,j}), j, 1, DIM(a')), i, 1,
  DIM(a))

tra_rett__(a, vu_, ve_) := azz_col_piv(div_rig_piv_(tra_rett(a, vu_, ve_), vu_, ve_), vu_, ve_)

simplex_met_(cfo, a, va, nda) :=
  Prog
    PrecisionDigits := nda
    ma := a
    va_ := va
    con := 0
    tp := VECTOR([cfo↓(va_↓i↓1)], i, 1, DIM(ma))
    mat := [[["Tabelle del simplesso"]]]
    Loop
      con :+ 1
      tp := VECTOR([cfo↓(va_↓i↓1)], i, 1, DIM(ma))
      ve__ := ve(tp, ma, cfo)
      If ve__ = false
         RETURN APPEND([[mat]], [[t5(tp, va_, cfo, ma)]])
      If DIM(ve__) = 1
         Prog
           ve__ := ve__↓1
           vu__ := vu(ma, ve__)
         ve_vu_(a, ve__)
      If vu__ = false
         RETURN ["Non esiste uscita "; mat; t5(tp, va_, cfo, ma)]
      mat := APPEND(mat, [[t7(tp, va_, cfo, ma, vu__, ve__)]])
      ma := tra_rett__(ma, vu__, ve__)
      va_ := tra_r_c(REPLACE(ve__, tra_c_r(va_), vu__))
      If con = 20
         RETURN mat

simplex_met_([5, 2, 0, 0, 0], [[-1 -3 -1 0 0 2000], [-4 -1 0 -1 0 5000], [-3 -2 0 0 -1 4000]], [[3], [4], [5]], 3)
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[Tabelle del simplesso]

	Tassi	Var	x1	x2	x3	x4	x5	Ter.noti
	0	x3	-1	-3	-1	0	0	2000
→	0	x4	-4	-1	0	-1	0	5000
	0	x5	-3	-2	0	0	-1	4000
	Σ tp	Ci	0	0	0	0	0	0
	Tas	pro	5	2	0	0	0	1
	Tot		5	2	0	0	0	

	Tassi	Var	x1	x2	x3	x4	x5	Ter.noti
	0	x3	0	-2.75	-1	0.25	0	750
	5	x1	-1	-0.25	0	-0.25	0	1250
→	0	x5	0	-1.25	0	0.75	-1	250
	Σ tp	Ci	-5	-1.25	0	-1.25	0	6250
	Tas	pro	5	2	0	0	0	2
	Tot		0	0.75	0	-1.25	0	

Tassi	Var	x1	x2	x3	x4	x5	Ter.noti
0	x3	0	0	-1	-1.4	2.2	200
5	x1	-1	0	0	-0.4	0.2	1200
2	x2	0	-1	0	0.6	-0.8	200
Σ tp	Ci	-5	-2	0	-0.8	-0.6	6400
Tas	pro	5	2	0	0	0	3
Tot		0	0	0	-0.8	-0.6	