

NAG Toolbox for MATLAB

h02bv

1 Purpose

h02bv prints the solution to a linear or integer programming problem computed by e04mf or h02bb and h02bz, with user-supplied names for the rows and columns.

2 Syntax

```
[ifail] = h02bv(a, bl, bu, x, clamda, istate, crname, 'n', n, 'm', m)
```

3 Description

h02bv prints the solution to a linear or integer programming problem with user-supplied names for the rows and columns. All output is written to the current advisory message unit (as defined by x04ab). The function must be preceded in the same program by calls to either e04mf (if an LP problem has been solved) or h02bb and h02bz (if an IP problem has been solved). The documents for e04mf and/or h02bb and h02bz should be consulted for further details.

4 References

IBM 1971 MPSX – Mathematical programming system *Program Number 5734 XM4* IBM Trade Corporation, New York

5 Parameters

5.1 Compulsory Input Parameters

- 1: **a(lda,*) – double array**

The first dimension of the array **a** must be at least $\max(1, m)$

The second dimension of the array must be at least **n** if **m** > 0 and at least 1 if **m** = 0

The matrix of general linear constraints.

- 2: **bl(n + m) – double array**

The lower bounds for all the constraints, as returned by e04mf or h02bz.

- 3: **bu(n + m) – double array**

The upper bounds for all the constraints, as returned by e04mf or h02bz.

- 4: **x(n) – double array**

The solution to the problem, as returned by e04mf or h02bb.

- 5: **clamda(n + m) – double array**

The Lagrange-multipliers (reduced costs) for each constraint with respect to the working set, as returned by e04mf or h02bz.

- 6: **istate(n + m) – int32 array**

The status of every constraint in the working set at the solution, as returned by e04mf or h02bz.

7: **cname**(**n** + **m**) – string array

The user-defined names for all the variables and constraints.

5.2 Optional Input Parameters

1: **n** – int32 scalar

Default: The dimension of the array **x**.
the number of variables.

Constraint: $n > 0$.

2: **m** – int32 scalar

The number of general linear constraints.

Constraint: $m \geq 0$.

5.3 Input Parameters Omitted from the MATLAB Interface

lda

5.4 Output Parameters

1: **ifail** – int32 scalar

0 unless the function detects an error (see Section 6).

6 Error Indicators and Warnings

Errors or warnings detected by the function:

ifail = 1

On entry, $n \leq 0$,
or $m < 0$,
or $lda < \max(1, m)$.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

```
n = int32(6);
m = int32(3);
itmax = int32(0);
msglvl = int32(0);
a = [ 110, 205, 160, 160, 420, 260;
      4, 32, 13, 8, 4, 14;
      2, 12, 54, 285, 22, 80];
b1 = [0;
      0;
      0;
      0;
      0;
```

```

0;
2000;
55;
800];
bu = [4;
3;
2;
8;
2;
2;
1e+20;
1e+20;
1e+20];
intvar = [int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1)];
cvec = [3;24;13;9;20;19];
maxnod = int32(0);
intfst = int32(0);
toliv = 0;
tolfes = 0;
bigbnd = 1e+20;
x = zeros(6,1);

crname = {'OATMEAL ' ; 'CHICKEN ' ; 'EGGS      ' ; 'MILK      ' ; 'PIE      ' ;
'BACON     ' ; 'ENERGY   ' ; 'PROTEIN  ' ; 'CALCIUM  '};

[itmax, toliv, tolfes, bigbnd, x, objmip, iwork, rwork, ifail] = ...
    h02bb(itmax, msglvl, a, bl, bu, intvar, cvec, maxnod, intfst, toliv,
    tolfes, bigbnd, x);

[bl, bu, clamda, istate, ifail] = h02bz(n, m, iwork, rwork);

[ifail] = h02bv(a, bl, bu, x, clamda, istate, crname)

```

Varbl	State	Value	Lower Bound	Upper Bound	Lagr	Mult
Residual						
OATMEAL	EQ	4.00000	4.00000	4.00000	3.000	
0.000						
CHICKEN	LL	0.00000	0.00000	3.00000	24.00	
0.000						
EGGS	LL	0.00000	0.00000	2.00000	13.00	
0.000						
MILK	LL	5.00000	5.00000	8.00000	9.000	
0.000						
PIE	EQ	2.00000	2.00000	2.00000	20.00	
0.000						
BACON	LL	0.00000	0.00000	2.00000	19.00	
0.000						
L Con						
Residual						
ENERGY	FR	2080.00	2000.00	None	0.000	
80.00						
PROTEIN	FR	64.0000	55.0000	None	0.000	
9.000						
CALCIUM	FR	1477.00	800.000	None	0.000	
677.0						
ifail =						
	0					