# Assignment 1:

# Submitted by : Adrita Dutta (axd172930)

1)Formulate the following as a linear programming problem.

A candy manufacturer has 130 pounds of chocolate-covered cherries and 170 pounds of chocolate-covered mints in stock.

He decides to sell them in the form of two different mixtures.

One mixture will contain half cherries and half mints by weight and will sell for $2.00 per pound.

The other mixture will contain one-third cherries and two-thirds mints by weight and will sell for $1.25 per pound.

How many pounds of each mixture should the candy manufacturer prepare in order to maximize his sales revenue?

## Solution:

**LP Formulation:**

=> Max: $2x_1 + 1.25x_2$

Constraints: $0.5x_1 + 0.33x_2 <= 130$

$0.5\ x_1 + 0.67x_2 <= 170$

**Final answer:**

**Z(Max Sales Revenue) =$520**

$x_1$**=260(Mix1) -> 130(chocolate-covered cherries-> R1) + 130 (chocolate-covered mints->R2)**

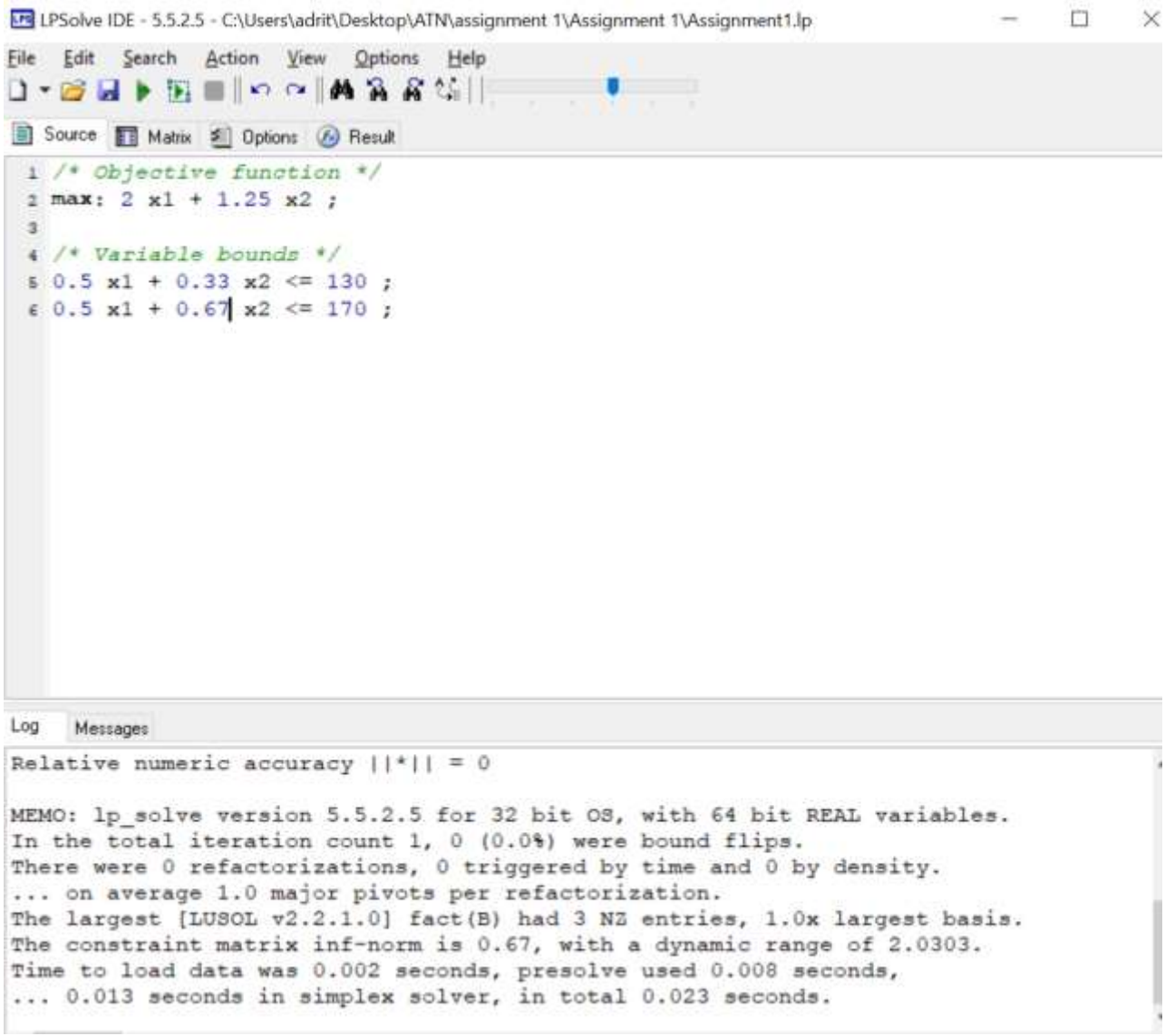
$x_2$**=0(Mix2)**

**Matrix of problem:**

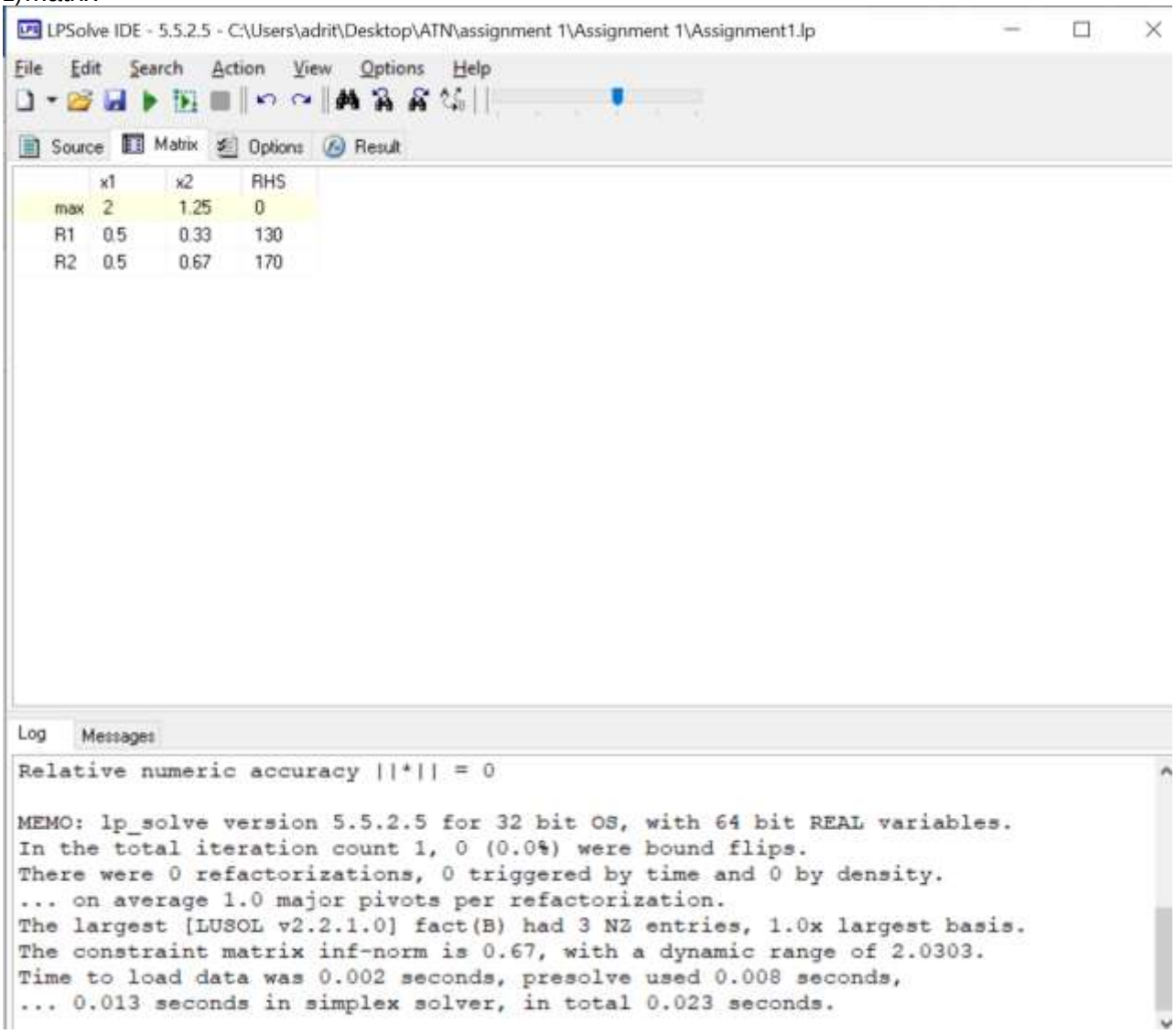
| | Mix 1 | Mix2 | TOTAL QUANTITY AVAILABLE | |
|---|---|---|---|---|
| | 0.5 | 0.33 | 130 | chocolate-covered cherries(R1) |
| | 0.5 | 0.33 | 170 | chocolate-covered mints(R2) |
| COST/pound | $2 | $1.25 | | |

**Screenshots:**

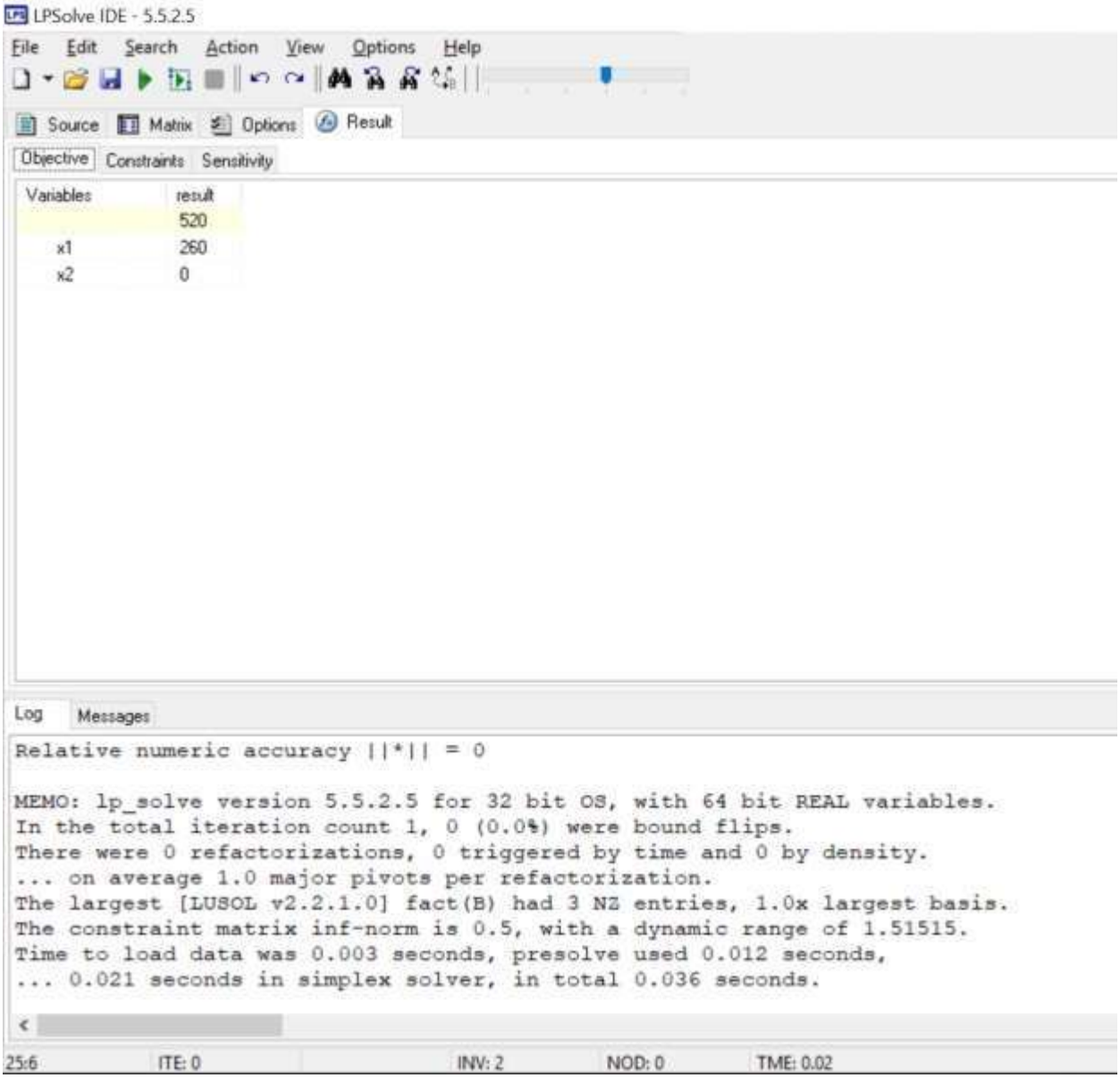
1) lp formualtion



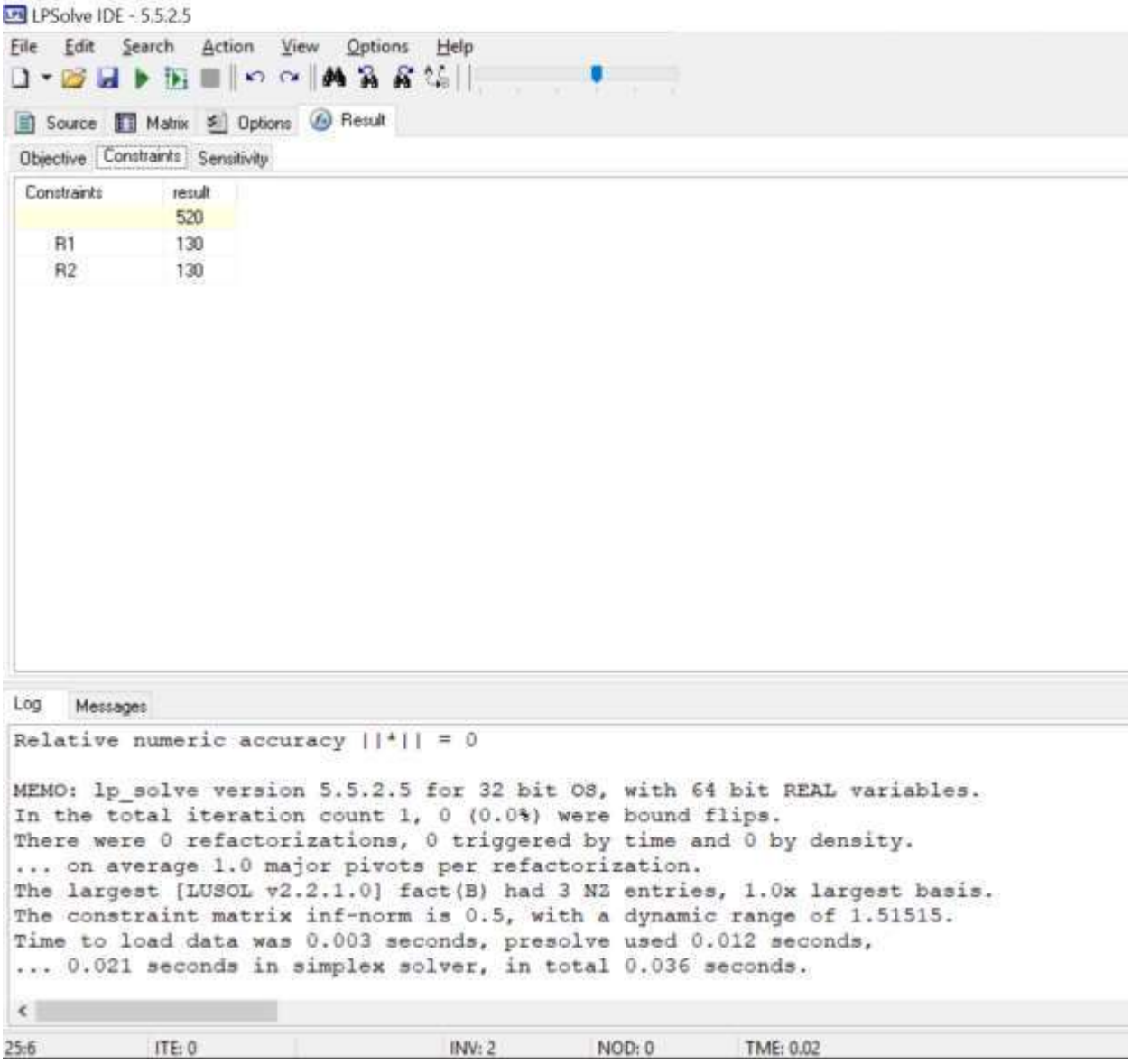
2) matrix



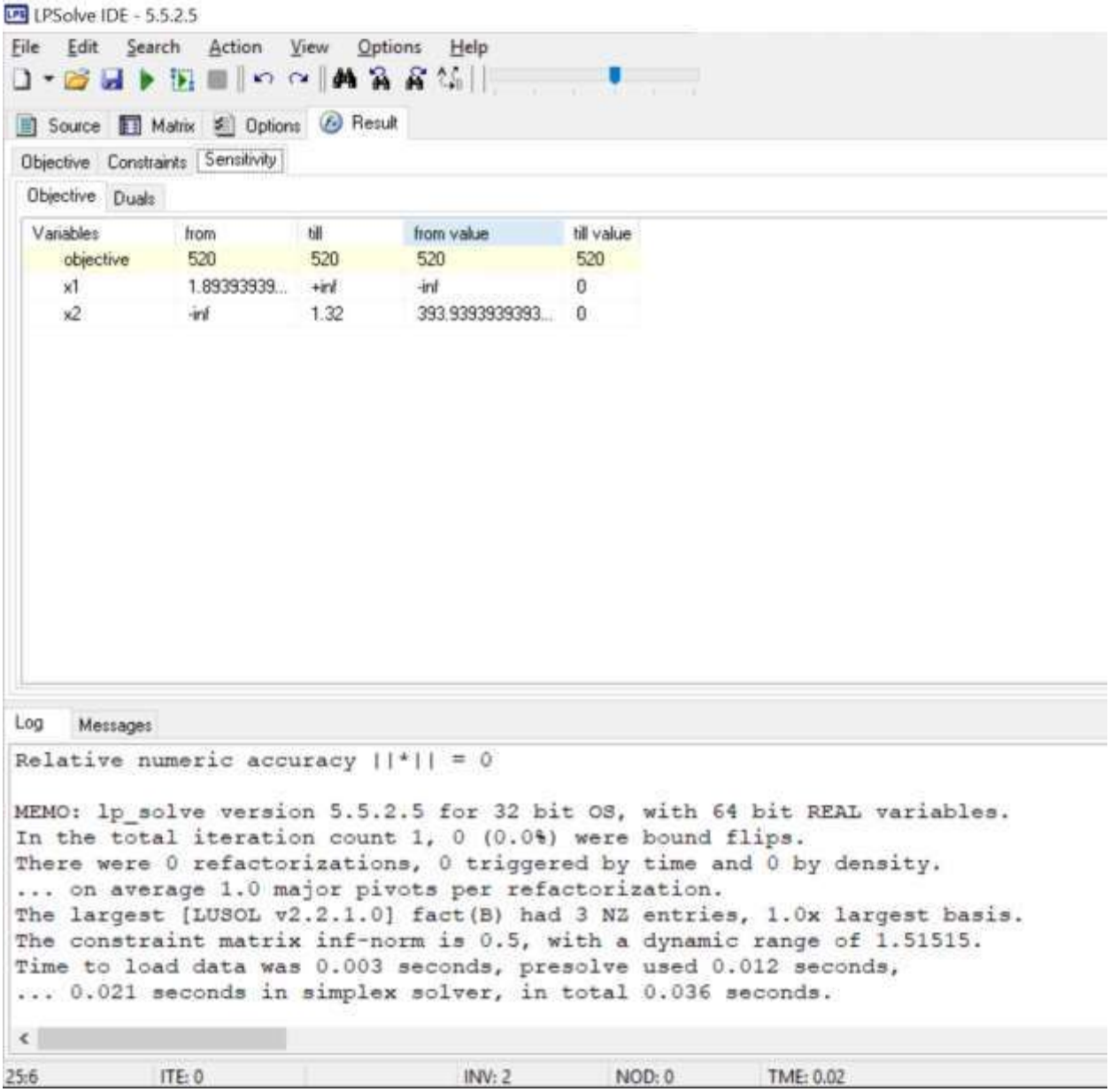

3) objective:




4) constraints:




5) sensitivity:


LPSolve IDE - 5.5.2.5
File Edit Search Action View Options Help
Source Matrix Options Result
Objective Constraints Sensitivity
Objective Duals
Variables from till from value till value
objective 520 520 520 520
x1 1.89393939... +inf -inf 0
x2 -inf 1.32 393.9393939393... 0
Log Messages
Relative numeric accuracy ||*|| = 0
MEMO: lp_solve version 5.5.2.5 for 32 bit OS, with 64 bit REAL variables.
In the total iteration count 1, 0 (0.0%) were bound flips.
There were 0 refactorizations, 0 triggered by time and 0 by density.
... on average 1.0 major pivots per refactorization.
The largest [LUSOL v2.2.1.0] fact(B) had 3 NZ entries, 1.0x largest basis.
The constraint matrix inf-norm is 0.5, with a dynamic range of 1.51515.
Time to load data was 0.003 seconds, presolve used 0.012 seconds,
... 0.021 seconds in simplex solver, in total 0.036 seconds.
25:6 ITE: 0 INV: 2 NOD: 0 TME: 0.02