

* LogMIP Input File for Small example 2

*

```
SET I /1*3/;
SET J /1*2/;
SCALAR M /100/;
BINARY VARIABLES Y(I);
POSITIVE VARIABLES X(J), C;
VARIABLE Z;
EQUATIONS EQUAT1, EQUAT2, EQUAT3, EQUAT4, EQUAT5, EQUAT6,
DUMMY, OBJECTIVE;
```

```
EQUAT1..      X('2')- X('1') + 2 =L=0;
EQUAT2..      C =E= 5 ;
EQUAT3..      2 - X('2') =L= 0;
EQUAT4..      C =E= 7;
EQUAT5..      X('1')-X('2') =L= 1;
EQUAT6..      X('1') =E=0;
```

```
DUMMY.. SUM(I, Y(I)) =G= 0;
```

```
OBJECTIVE.. Z =E= C + 2*X('1') + X('2');
X.UP(J)=5;
C.UP=7;
```

```
$ONECHO > "%lm.info%"
DISJUNCTION D1,D2;
```

```
D1 IS
IF Y('1') THEN
EQUAT1;
EQUAT2;
ELSIF Y('2') THEN
EQUAT3;
EQUAT4;
ENDIF;
```

```
D2 IS
IF Y('3') THEN
EQUAT5;
ELSE
EQUAT6;
ENDIF;
```

```
Y('1') -> not Y('3');
Y('2') -> not Y('3');
Y('3') -> not Y('2');
```

OBSERVE the different syntax used to pose a two term disjunction where each term must satisfy a TRUE condition (handled by two different variables) against a two term disjunction with one TRUE term condition and the other with a FALSE one (handled by the same variable).

This constraints are in the form of logic propositions

```
$OFFECHO
```

```
OPTION MIP=LMBIGM
MODEL PEQUE2 /ALL/;
SOLVE PEQUE2 USING MIP MINIMIZING Z;
```

LMBIGM is the solver, which generates a MIP problem by applying the BigM relaxation of a disjunctive set. Then a conventional B&B algorithm solves the MIP GAMS Input file generated by the application.