```
$TITLE: M2-1.GMS  introductory model using MCP
* simple supply and demand model (partial equilibrium)

PARAMETERS
 A          intercept of supply on the P axis (MC at Q = 0)
 B          change in MC in response to Q - this is dP over dQ
 C          intercept of demand on the Q axis (demand at P = 0)
 D          response of demand to changes in price - dQ over dP
 TAX        a tax rate used later for experiments;

A = 2;
C = 6;
B = 1;
D = -1;

NONNEGATIVE VARIABLES
 P          price of good X
 X          quantity of good X;


EQUATIONS
 SUPPLY     supply relationship (marginal cost ge price)
 DEMAND     quantity demanded as a function of price;

SUPPLY..     A + B*X  =G=  P;
```

```
DEMAND..    X  =G=  C + D*P;


MODEL EQUIL /SUPPLY.X, DEMAND.P/;
OPTION MCP = PATH;
SOLVE EQUIL USING MCP;

* counter factual 1: shift the supply curve (marginal cost) up/left

A = 7;
SOLVE EQUIL USING MCP;

* country factual 2: shift the supply curve (marginal cost) down/right

A = -7;
SOLVE EQUIL USING MCP;




* exercise 1: extract economic information from the solution

PARAMETERS
 CONSPRICE   consumer price
 PRODPRICE   producer price (equal to marginal cost)
 TAXREV      tax revenue (note tax base is producer price)
```

```
 CONSURP1    consumer surplus with no tax
 CONSURP2    consumer surplus with 25% tax
 PROSURP1    producer "surplus" with no tax
 PROSURP2    producer "surplus" with 25% tax
 DWL         net loss from the tax;


EQUATIONS
 SUPPLY2;

SUPPLY2..    (A + B*X)*(1+TAX)  =G=  P;

MODEL EQUIL2 /SUPPLY2.X, DEMAND.P/;

A = 2;
TAX = 0;
SOLVE EQUIL2 USING MCP;

CONSURP1 = (-C/D - P.L)*X.L/2;
PROSURP1 = (P.L/(1+TAX) - A)*X.L/2;

TAX = 0.25;
SOLVE EQUIL2 USING MCP;

CONSURP2 = (-C/D - P.L)*X.L/2;
PROSURP2 = (P.L/(1+TAX) - A)*X.L/2;
```

```
CONSPRICE = P.L;
PRODPRICE = P.L/(1+TAX);
TAXREV = PRODPRICE*TAX*X.L;
DISPLAY CONSPRICE, PRODPRICE, TAXREV;

DWL = CONSURP1 + PROSURP1 - (CONSURP2 + PROSURP2 + TAXREV);
DISPLAY CONSURP1, PROSURP1, CONSURP2, PROSURP2, TAXREV, DWL;


*exercise 2, mismatch the complementary variables

TAX = 0;

MODEL EQUIL3 /SUPPLY.P, DEMAND.X/;

SOLVE EQUIL3 USING MCP;

P.L = 0;
X.L = 6;

A = 7;
SOLVE EQUIL3 USING MCP;

A = -7;
SOLVE EQUIL3 USING MCP;
```