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# CompTools, 28 April 2011

| JQuiz Instructions |
| --- |

Show questions one by one

1. Look at a portion of the spreadsheet for the standard Ramsey model. Which formula is in the cell C14?

|    | A | B | C | D | E | F |
| --- | --- | --- | --- | --- | --- | --- |
| 10 |   |   |   |   |   |   |
| 11 |   |   |   |   |   |   |
| 12 | time | 0 | 1 | 2 | 3 | 4 |
| 13 | consumption | 0,543 | 0,550 | 0,557 | 0,564 | 0,571 |
| 14 | capital | 7,000 | 7,027 | 7,047 | 7,062 | 7,069 |
| 15 |   |   |   |   |   |   |
| 16 | utilities | 1,474 | 1,454 | 1,433 | 1,414 | 1,394 |
| 17 |   |   |   |   |   |   |

A.    ?     =beta^C12/(1-tau)*C13^(1-tau)

B.    ?     =B14+theta*B14^alpha-B13

C.    ?     =C14+theta*C14^alpha-C13

D.    ?     =theta*B14^alpha-B13

2.  In an input-output model...

A.    ?     technology coefficients are determined given quantities and demand.

B.    ?     internal demand is determined given quantities and prices.

C.    ?     quantities produced are determined given technology and exogenouos demand.

D.    ?     prices are determined given technology and demand.

3.  When writing and solving an optimization problem in a spreadsheet...

a. ☐ the objective function needs at least two cells, containing formulas, to be specified.
b. ☐ the objective function is a formula in a cell, describing a function of the decision variables.
c. ☐ every constraint involves two cells, related by some inequality.
d. ☐ the decision variables must be entered as formulas in specific cells.

Check

4. To write the costraint x≥3 using GAMS, you type:

A.  ?  x =e= 3;

B.  ?  x ≥ 3;

C.  ?  x > 3;

D.  ?  x =g= 3;

5. An (intertemporal) decision problem is about:

A.  ?  taking the best action a among the choices in a set A of possible actions, facing different states.

B.  ?  picking the best state s among the possibe states in a set S.

C.  ?  choosing the best action at each time, keeping into account that this is going to possibly change the state of the world.

D.  ?  deferring decisions to future times when different states will materialize.

6. Which of the following sentences are correct?

A.  ?  More capital in a time period means more utility in that time period.

B.  ?  Less consumption in a time period means more utility in that time period.

C.  ?  More consumption in a time period means more utility in that time period.

D.   ?   More production in a time period means more utility in that time period

7.   Immagine to reduce tha capacity of the plants in a transportation model, leaving the other parameters unchanged.

A.   ?   Given the shortage, GAMS reports in the .lst file

"MODEL STATUS 3 UNBOUNDED"

B.   ?   GAMS may fail to find a solution. The .lst file reads

"SOLVER STATUS 1 NORMAL COMPLETION" "MODEL STATUS 4 INFEASIBLE"

C.   ?   GAMS always finds a solution and writes in the .lst file

"SOLVER STATUS 1 NORMAL COMPLETION"

D.   ?   GAMS always finds a solution and writes in the .lst file

"MODEL STATUS 1 OPTIMAL"

8.   In GAMS, the statements sqr(x) and sqrt(x)...

a.   ☐ mean different things.
b.   ☐ mean "x squared" and "square root of x", respectively.
c.   ☐ mean the same thing.
d.   ☐ both mean "square of x".

Check

9.   A small discount factor implies that

a.   ☐ Discount rate is small.
b.   ☐ Future consumption is preferred.
c.   ☐ Present consumption tends to be preferred.
d.   ☐ Discount rate is high.

Check

10.   The transportation model is a linear model because:

A.    ?    The objective function and the constraints are linear.

B.    ?    The constraints are linear.

C.    ?    The shipment cost depends linearly on the distance.

D.    ?    The objective function is linear.

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A.    ?    The objective function and the constraints are linear.

1) Give an informative description of one of the three general equilibrium models covered in class.

2) Give an informative description of a neural network model.

3) Write the GAMS code to maximize the function $x+xy^2$, with respect to the variables x and y, under the constraint $x^2+y^2 <=1$.

4) Comment the following GAMS ouptput (lst file), fixing as many errors as possible.

```
GAMS Rev 233  DII-DII 23.3.3 Mac Intel32/Darwin
04/27/11 19:16:47 Page 1
IO-1
C o m p i l a t i o n


  2  * Input-Output Model
  3
  4  MODEL IO /jd, eqx1, eqx2, eqx3/;          error because model
****          $140  $140  $140  $140          should be written later
  5
  6  SCALARS
  7  d1 final demand for x1  /4/
  8  d2 final demand for x2  /5/
  9  d3 final demand for x3  /3/;
  10
  11  VARIABLES
  12  x1 production level industry 1
  13  p2 production level industry 2          maybe p2 is
  14  x3 production level industry 3          wrong
  15  j  performance index;
  16
  17  EQUATIONS
  18  eqx1
  19  eqx2
  20  eqx3
  21  jd performance index definition;
  22
  23  jd..   j =E= 0          a ";" is missing
  24  eqx1.. x1 =E= 0.3*x1 + 0.2*x2 + 0.2*x3 + d1;
****     $409
  25  eqx2.. x2 =E= 0.1*x1 + 0.4*x2 + 0.5*x3 + d2;
****        $140                               x2 was never
  26  eq x3.. x3 =E= 0.4*x1 + 0.1*x2 + 0.2*x3 + d3;  defined (because
****   $140,36,409      one space is too        of p2 above)
  27                         much
  28  MODEL IO /jd, eqx1, eqx2, eqx3/;
****          $194
  29
                  repeated MODEL statement
```

30  SOLVE IO MAXIMIZING J USING LP;
****                    $257

*as $257 shows, GAMS cannot solve a model because of previous errors*

31
32  DISPLAY p1.l, x2.l, x3.l
****        $140      $141

*p1 and x2 were never defined, the reis nothing to display given that the code had mistakes*

Error Messages


 36  '=' or '..' or ':=' or '$=' operator expected
     rest of statement ignored
140  Unknown symbol
141  Symbol neither initialized nor assigned
     A wild shot: You may have spurious commas in the explanatory
     text of a declaration. Check symbol reference list.
194  Symbol redefined - a second data statement for the same symbol
     or a data statement after an assignment
257  Solve statement not checked because of previous errors
409  Unrecognizable item - skip to find a new statement
     looking for a ';' or a key word to get started again

**** 13 ERROR(S)   0 WARNING(S)


COMPILATION TIME    =      0.005 SECONDS     2 Mb  DII233-233 Dec 15, 2009

**** FILE SUMMARY

Input      /Users/paolop/sincro/didattica/comptools2011/compiti/prova28aprile/
io-1_wrong.gms
Output     /Users/paolop/sincro/didattica/comptools2011/compiti/prova28aprile/
io-1_wrong.lst

**** USER ERROR(S) ENCOUNTERED