ACCOUNTRONIC SOFTWARE

Excel

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بسم الله الرحمن الرحيم

ثُمَّ رُدُّواْ إِلَى اللّهِ مَوْلاَهُمُ الْحَقِّ أَلاَ لَهُ الْحُكْمُ وَهُوَ
أَسْرَعُ الْحَاسِبِينَ (الأنعام : 62)

صدق اللـه العظيم

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Solver   -

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Multiple   )   -
QBasic   (**Objective Programming**

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Power Point

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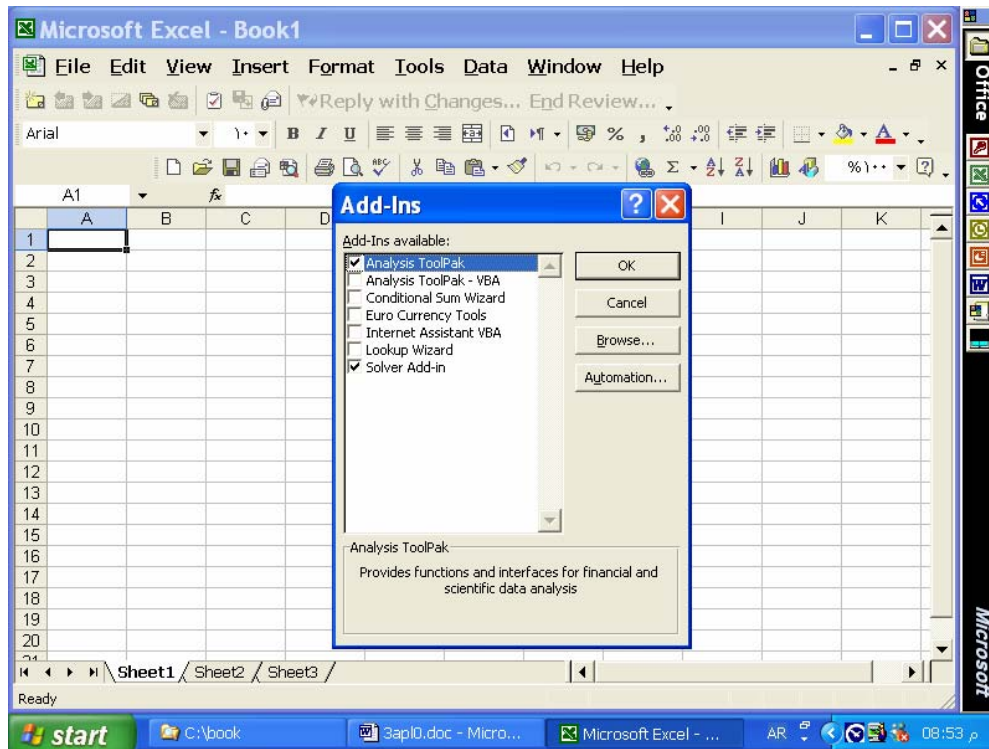
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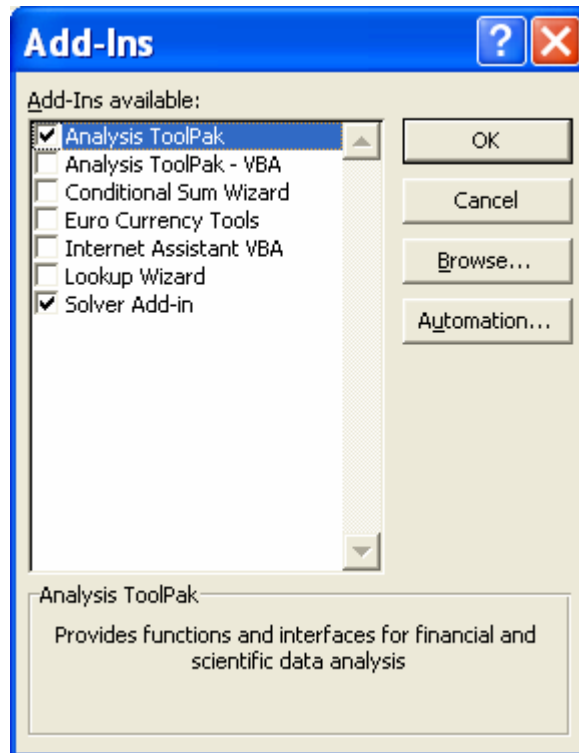
Solver

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Data Analysis (Analysis   **Solver**
                    .   **Tools**   **ToolPak)**
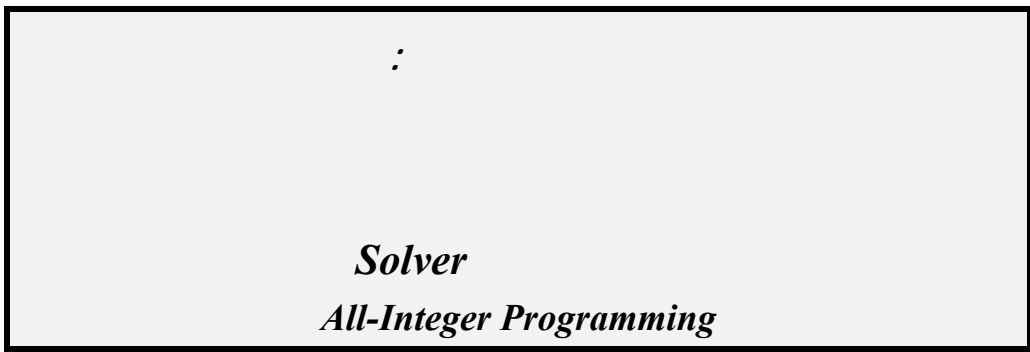   :   **Add Ins**

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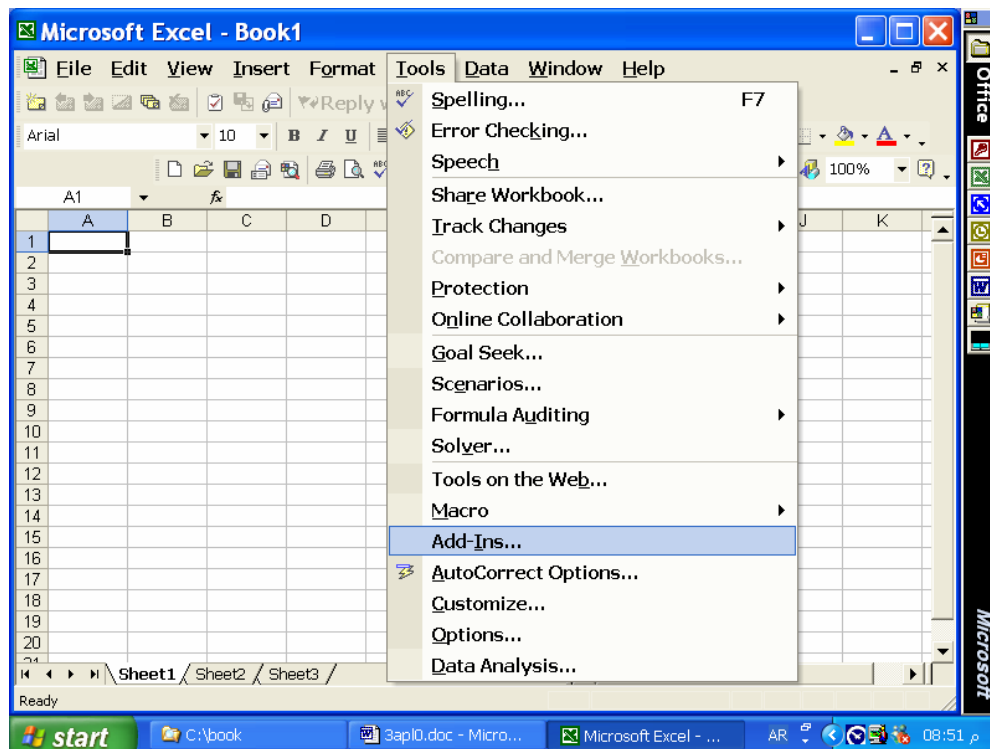
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> *:*
>
> # *Solver*
> ## *All-Integer Programming*

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Solver

Data File: ip.xls

A real estate has $2 million available for the purchase of new rental property. Each townhouse can be purchased for $282000, and 5 are available. Each apartment building can be purchased for $400000. The manager can devote up to 140 h0urs per moth to this capital budget; each townhouse requires 4 hours per month and each apartment building requires 40 hours per month. The annual net cash flow is estimated to be $10000 per townhouse and $15000 per apartment building. Determine the number of decision variables to purchase to maximize annual cash flow:

        T = number of townhouses
        A = number of apartment buildings

The objective function for cash flow ($1000s) is:
        Max   10T + 15T

  s.t.

        282T + 400A <= 2000 Funds available ($1000s)
        4 T + 40 A <= 140   Manager's time (hours)
        T   <= 5   Townhouses available
        T, A => 0 and integer

(Enter the next model parameters to excel worksheet and solve the model, data already entered to data file):

Descriptive labels: Cells A1:G7.
Decision Variables: Cells B17:C17.
Objective Function : Cell B13 = SUMPRODUCT(B7:C7;B17:C17).
Left-Hand Sides: Cells F15:F17
    Cell F15 = SUMPRODUCT(B4:C4;B17:C17)
    Cell F17=B17
Right-Hand Sides: Cells H15:H17
    Cell H15=G4

1. **Let the active cell B13 before performing Solver. Select "int" when Adding first constraint. Select Solver Options and enter the parameters shown in the following screens.**
2. **(a) Select the Tools pull-down menu, (b) Select the Solver option, (c) When the Solver Parameters dialog box appears enter B13 into the set cell box, select Equal To: Max option.**

The following screens exhibit the above steps to solve the excel application (Note: Required data file is already saved on OR Data Files Subdirectory):

ip.xls :

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    T = number of townhouses

    A = number of apartment buildings
The objective function for cash flow ($1000s) is:
    Max   10T + 15T
 s.t.
    282T + 400A <= 2000 Funds available ($1000s)

4 T + 40 A <= 140   Manager's time (hours)

T   <= 5   Townhouses available

T, A => 0 and integer

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-2   Solver

B13   .

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Solve   .

Keep Solver Solution

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-3   int   Solver Options

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Microsoft Excel - ip.xls

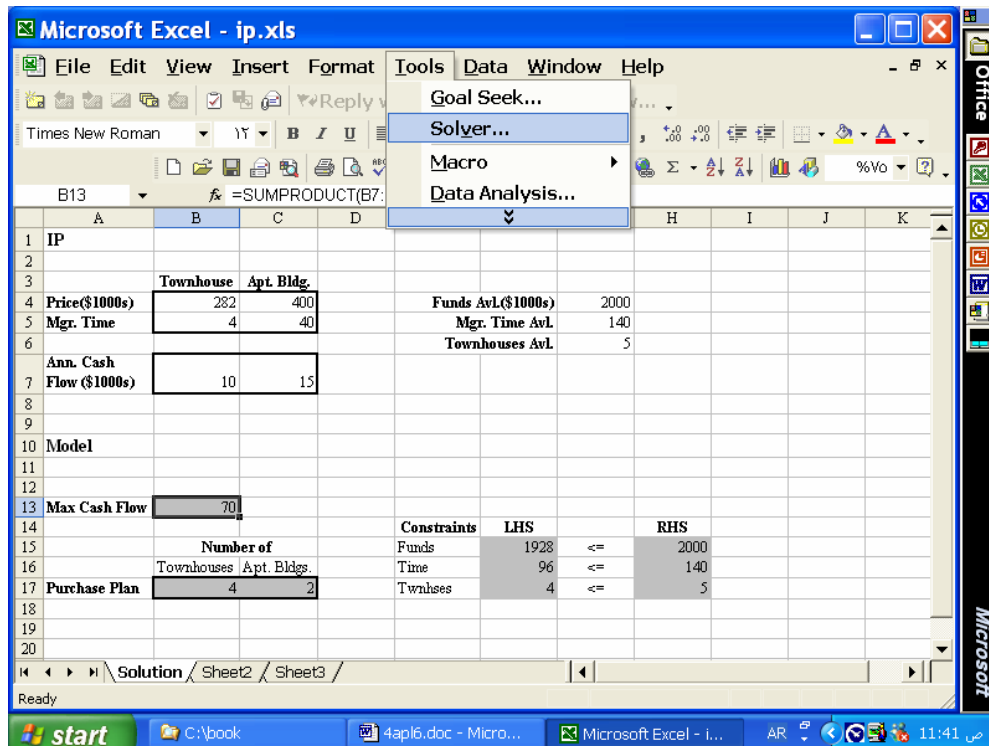File Edit View Insert Format Tools Data Window Help

Times New Roman ▾ 14 ▾ | **B** *I* U | ... 75% ▾

A1 ▾ *fx* IP

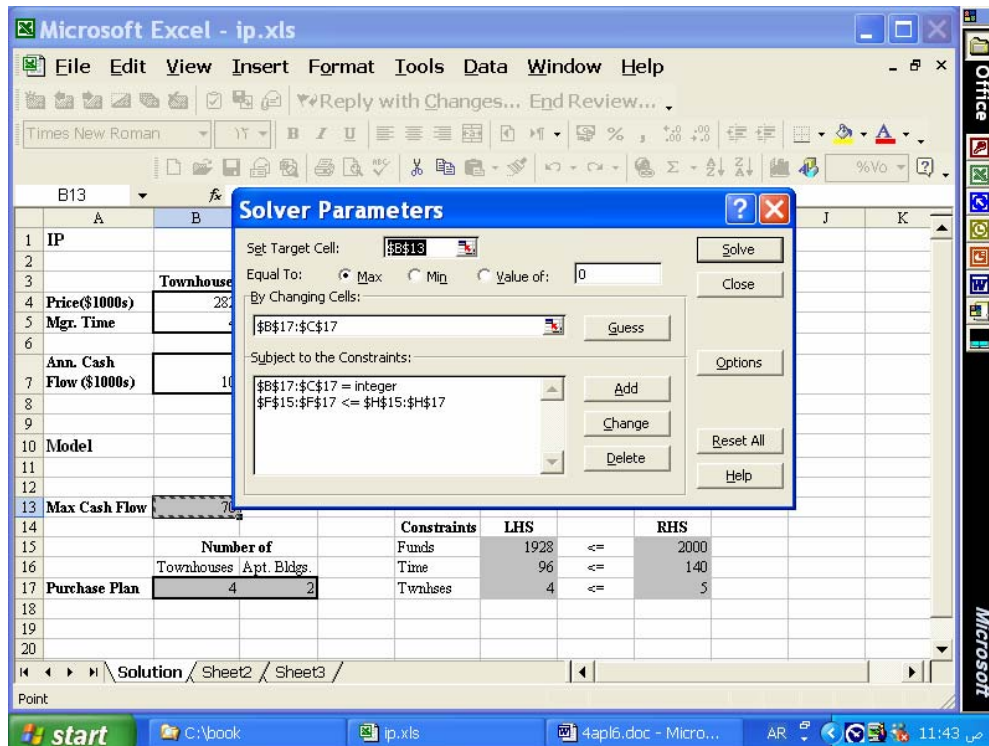|	A	B	C	D	E	F	G	H	I	J	K
1	IP										
2											
3		Townhouse	Apt. Bldg.								
4	Price($1000s)	282	400		Funds Avl.($1000s)		2000				
5	Mgr. Time	4	40		Mgr. Time Avl.		140				
6					Townhouses Avl.		5				
7	Ann. Cash Flow ($1000s)	10	15								
8											
9											
10	Model										
11											
12											
13	Max Cash Flow	70									
14					Constraints	LHS		RHS			
15		Number of			Funds	1928	<=	2000			
16		Townhouses	Apt. Bldgs.		Time	96	<=	140			
17	Purchase Plan	4	2		Twnhses	4	<=	5			
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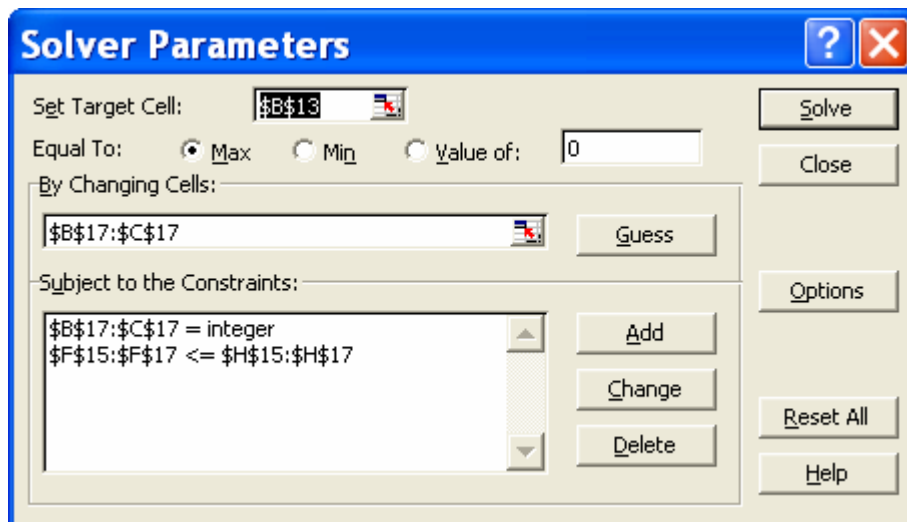|◄ ◄ ► ►|\ Solution / Sheet2 / Sheet3 /

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Microsoft Excel - ip.xls

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B13   =SUMPRODUCT(B7:C7;B17:C17)

	A	B	C	D	E	F	G	H	I	J	K
1	IP										
2											
3		Townhouse	Apt. Bldg.								
4	Price($1000s)	282	400			Funds Avl.($1000s)	2000				
5	Mgr. Time	4	40			Mgr. Time Avl.	140				
6						Townhouses Avl.	5				
7	Ann. Cash Flow ($1000s)	10	15								
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16		Townhouses	Apt. Bldgs.		Time	96	<=	140			
17	Purchase Plan	4	2		Twnhses	4	<=	5			
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Solution / Sheet2 / Sheet3 /

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Microsoft Excel - ip.xls

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B13 = =SUMPRODUCT(B7:C7;B17:C17)

	A	B	C	D	E	F	G	H	I	J	K
1	IP										
2											
3		Townhouse	Apt. Bldg.								
4	Price($1000s)	282	400		Funds Avl.($1000s)		2000				
5	Mgr. Time	4	40		Mgr. Time Avl.		140				
6					Townhouses Avl.		5				
7	Ann. Cash Flow ($1000s)	10	15								
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13	Max Cash Flow	70									
14					Constraints	LHS		RHS			
15		Number of			Funds	1928	<=	2000			
16		Townhouses	Apt. Bldgs.		Time	96	<=	140			
17	Purchase Plan	4	2		Twnhses	4	<=	5			
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Solution / Sheet2 / Sheet3 /

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